HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

AC

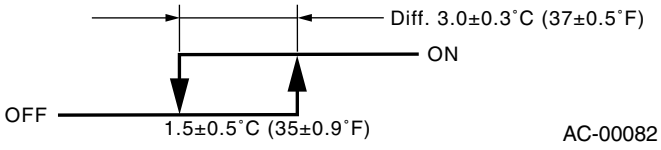
1. General Description

A: SPECIFICATIONS

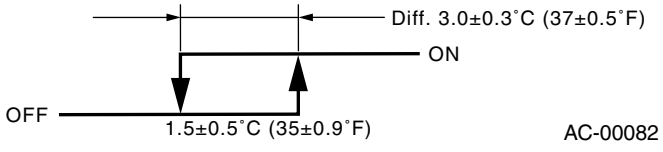
1. HEATER SYSTEM

Item		Specifications	Condition
Heating capacity		5.0 kW (4,300 kcal/h, 17,062 BTU/h) or more	• Mode selector switch: HEAT • Temperature control switch: FULL HOT • Temperature difference between hot water and inlet air: 65°C (149°F) • Hot water flow rate: 360 ℓ (95.1 US gal, 79.2 Imp gal)/h
Air flow rate		300 m^3 (10,593 cu ft)/h	Heat mode (FRESH), FULL HOT at 12.5 V
Max air flow rate		500 m^3 (17,655 cu ft)/h	• Temperature control switch: FULL COLD • Blower fan speed: 4th position • Mode selector lever: RECIRC
Heater core size (height × length × width)		193.5 × 152 × 35.0 mm (7.62 × 5.98 × 1.378 in)	—
Blower motor	Type	Magnet motor 220 W or less	at 12 V
	Fan type and size (diameter × width)	Sirocco fan type 150 × 75 mm (5.91 × 2.95 in)	—

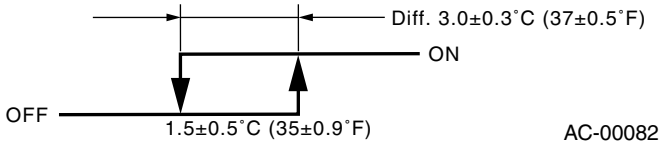
2. A/C SYSTEM (4 CYLINDER NON-TURBO MODEL)

Item			Specifications
Type of air conditioner			Reheat air-mix type
Cooling capacity			5.2 kW (4,471 kcal/h, 17,741 BTU/h)
Refrigerant			HFC-134a (CH_2FCF_3) [0.65±0.05 kg (1.43±0.11 lb)]
Compressor		Type	5-vane rotary, fix volume (DKV-14G)
		Discharge	140 cm^3 (8.54 cu in)/rev
		Max. permissible speed	7,000 rpm
Magnet clutch		Type	Dry, single-disc type
		Power consumption	45 W
		Type of belt	V-Ribbed 4 PK
		Pulley dia. (effective dia.)	125 mm (4.92 in)
		Pulley ratio	1.064
Condenser		Type	Corrugated fin (Multi-flow)
		Core face area	0.21 m^2 (2.26 sq ft)
		Core thickness	24 mm (0.94 in)
		Radiation area	6.52 m^2 (70 sq ft)
Receiver drier		Effective inner capacity	250 cm^3 (15.26 cu in)
Expansion valve		Type	External equalizing
Evaporator		Type	Single tank
		Dimensions (W × H × T)	235 × 224 × 60 mm (9.25 × 8.82 × 2.36 in)
Blower fan		Fan type	Sirocco fan
		Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
		Power consumption	220 W at 12 V
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	75 W at 12 V
		Fan outer diameter	300 mm (11.81 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	75 W at 12 V
		Fan outer diameter	300 mm (11.81 in)
Idling speed (A/C ON)		MPFI model	850±100 rpm
Dual switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	177±25 kPa (1.80±0.25 kg/cm^2, 25.6±3.6 psi)
		OFF → ON	$216^{+39}/_{-25}$ kPa ($2.2^{+0.4}/_{-0.25}$ kg/cm^2, $31^{+5.7}/_{-3.6}$ psi)
	High-pressure switch operating pressure	ON → OFF	2,942±196 kPa (30±2 kg/cm^2, 427±28 psi)
		DIFF	588±196 kPa (6±2 kg/cm^2, 85±28 psi)
Thermo control amplifier working temperature (Evaporator outlet air)			

3. A/C SYSTEM (4 CYLINDER TURBO MODEL)

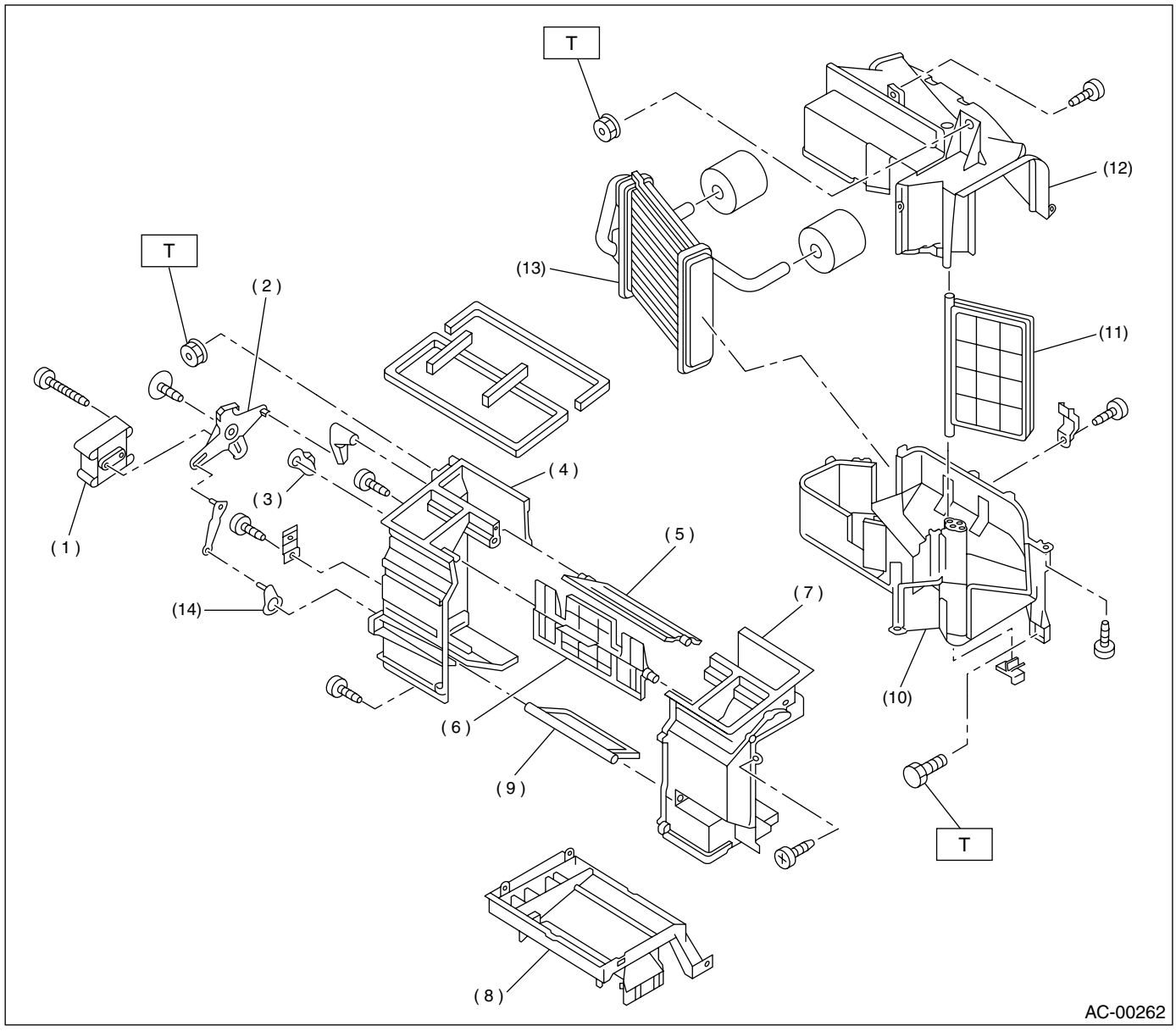
Item			Specifications
Type of air conditioner			Reheat air-mix type
Cooling capacity			5.2 kW (4,471 kcal/h, 17,741 BTU/h)
Refrigerant			HFC-134a (CH_2FCF_3) [0.65±0.05 kg (1.43±0.11 lb)]
Compressor		Type	5-vane rotary, fix volume (DKV-14G)
		Discharge	140 cm^3 (8.54 cu in)/rev
		Max. permissible speed	7,000 rpm
Magnet clutch		Type	Dry, single-disc type
		Power consumption	45 W
		Type of belt	V-Ribbed 4 PK
		Pulley dia. (effective dia.)	125 mm (4.92 in)
		Pulley ratio	1.064
Condenser		Type	Corrugated fin (Multi-flow)
		Core face area	0.21 m^2 (2.26 sq ft)
		Core thickness	24 mm (0.94 in)
		Radiation area	6.52 m^2 (70 sq ft)
Receiver drier		Effective inner capacity	250 cm^3 (15.26 cu in)
Expansion valve		Type	External equalizing
Evaporator		Type	Single tank
		Dimensions (W × H × T)	235 × 224 × 60 mm (9.25 × 8.82 × 2.36 in)
Blower fan		Fan type	Sirocco fan
		Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
		Power consumption	220 W at 12 V
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	120 W at 12 V
		Fan outer diameter	320 mm (12.60 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	120 W at 12 V
		Fan outer diameter	320 mm (12.60 in)
Idling speed (A/C ON)		MPFI model	850±100 rpm
Triple switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	177±25 kPa (1.80±0.25 kg/cm^2, 25.60±3.56 psi)
		OFF → ON	206±30 kPa (2.10±0.31 kg/cm^2, 29.86±4.41 psi)
	High-pressure switch operating pressure	ON → OFF	2,940±200 kPa (29.98±2.03 kg/cm^2, 426.32±28.87 psi)
		DIFF	590±200 kPa (6.02±2.03 kg/cm^2, 85.6±28.87 psi)
	Middle-pressure switch operating pressure	ON → OFF	1,370±120 kPa (13.97±1.22 kg/cm^2, 198.65±17.35 psi)
		OFF → ON	1,770±100 kPa (18.05±1.02 kg/cm^2, 256.81±14.50 psi)
Thermo control amplifier working temperature (Evaporator outlet air)			

4. A/C SYSTEM (6 CYLINDER)

Item			Specifications
Type of air conditioner			Reheat air-mix type
Cooling capacity			5.2 kW (4,471 kcal/h, 17,741 BTU/h)
Refrigerant			HFC-134a (CH_2FCF_3) [0.65±0.05 kg (1.43±0.11 lb)]
Compressor		Type	5-vane rotary, fix volume (DKV-14G)
		Discharge	140 cm^3 (8.54 cu in)/rev
		Max. permissible speed	7,000 rpm
Magnet clutch		Type	Dry, single-disc type
		Power consumption	38 W
		Type of belt	V-Ribbed 6 PK
		Pulley dia. (effective dia.)	125 mm (4.92 in)
		Pulley ratio	1.064
Condenser		Type	Corrugated fin (Multi-flow)
		Core face area	0.22 m^2 (2.37 sq ft)
		Core thickness	24 mm (0.94 in)
		Radiation area	6.52 m^2 (70 sq ft)
Receiver drier		Effective inner capacity	250 cm^3 (15.26 cu in)
Expansion valve		Type	External equalizing
Evaporator		Type	Single tank
		Dimensions (W × H × T)	235 × 224 × 60 mm (9.25 × 8.82 × 2.36 in)
Blower fan		Fan type	Sirocco fan
		Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
		Power consumption	220 W at 12 V
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	120 W at 12 V
		Fan outer diameter	320 mm (12.60 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	120 W at 12 V
		Fan outer diameter	320 mm (12.60 in)
Idling speed (A/C ON)		MPFI model	850±100 rpm
Triple switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	177±25 kPa (1.80±0.25 kg/cm^2, 25.60±3.56 psi)
		OFF → ON	206±30 kPa (2.10±0.31 kg/cm^2, 29.86±4.41 psi)
	High-pressure switch operating pressure	ON → OFF	2,940±200 kPa (29.98±2.03 kg/cm^2, 426.32±28.87 psi)
		DIFF	590±200 kPa (6.02±2.03 kg/cm^2, 85.6±28.87 psi)
	Middle-pressure switch operating pressure	ON → OFF	1,370±120 kPa (13.97±1.22 kg/cm^2, 198.65±17.35 psi)
		OFF → ON	1,770±100 kPa (18.05±1.02 kg/cm^2, 256.81±14.50 psi)
Thermo control amplifier working temperature (Evaporator outlet air)			 AC-00082

B: COMPONENT

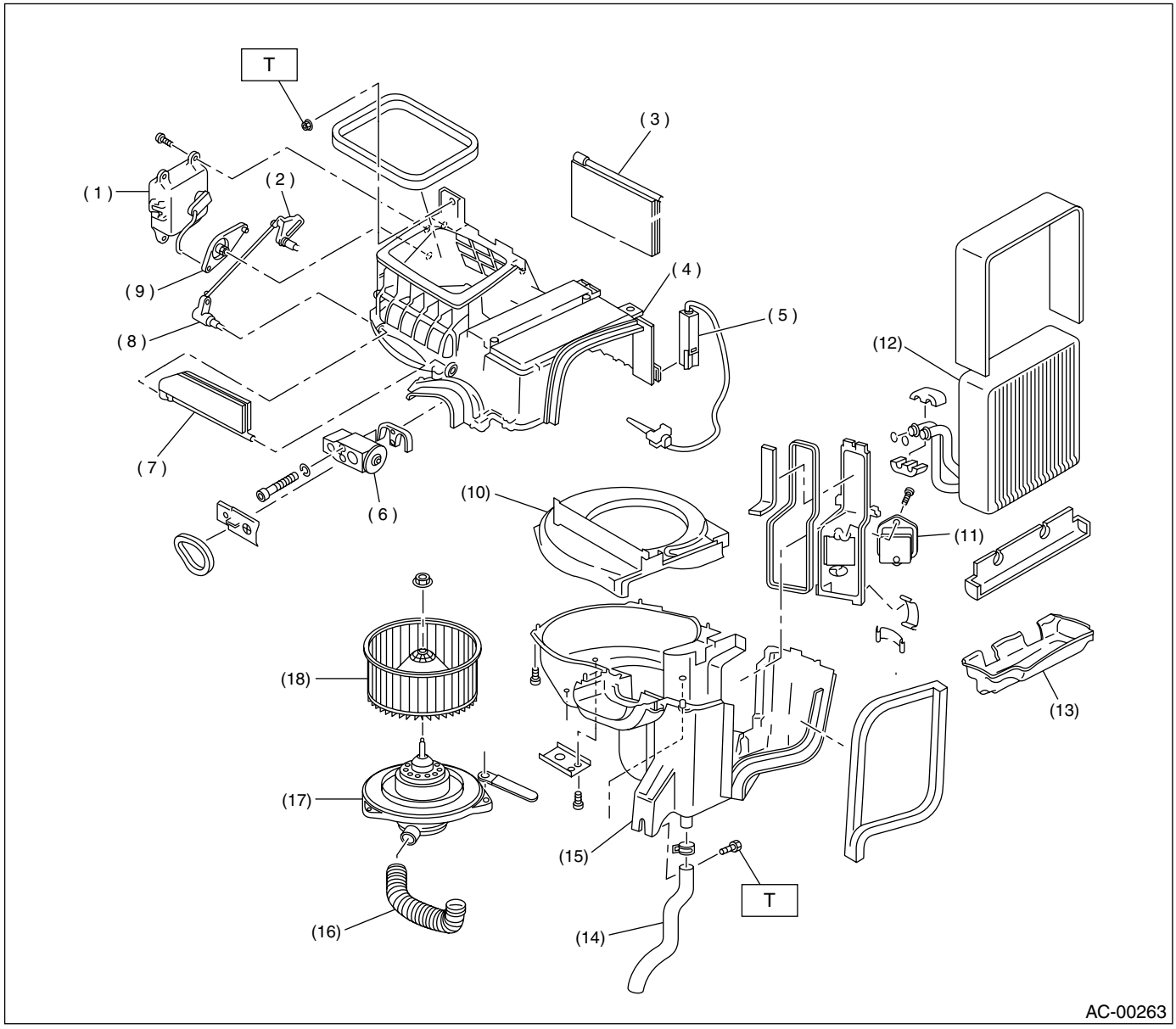
1. HEATER UNIT



(1) Vent door actuator
(2) Side link
(3) Vent door lever
(4) Case A
(5) DEF door
(6) Vent door
(7) Case B
(8) Foot duct
(9) Foot door
(10) Case D
(11) Mix door
(12) Case C
(13) Heater core
(14) Foot door lever

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.35 (0.750, 5.421)

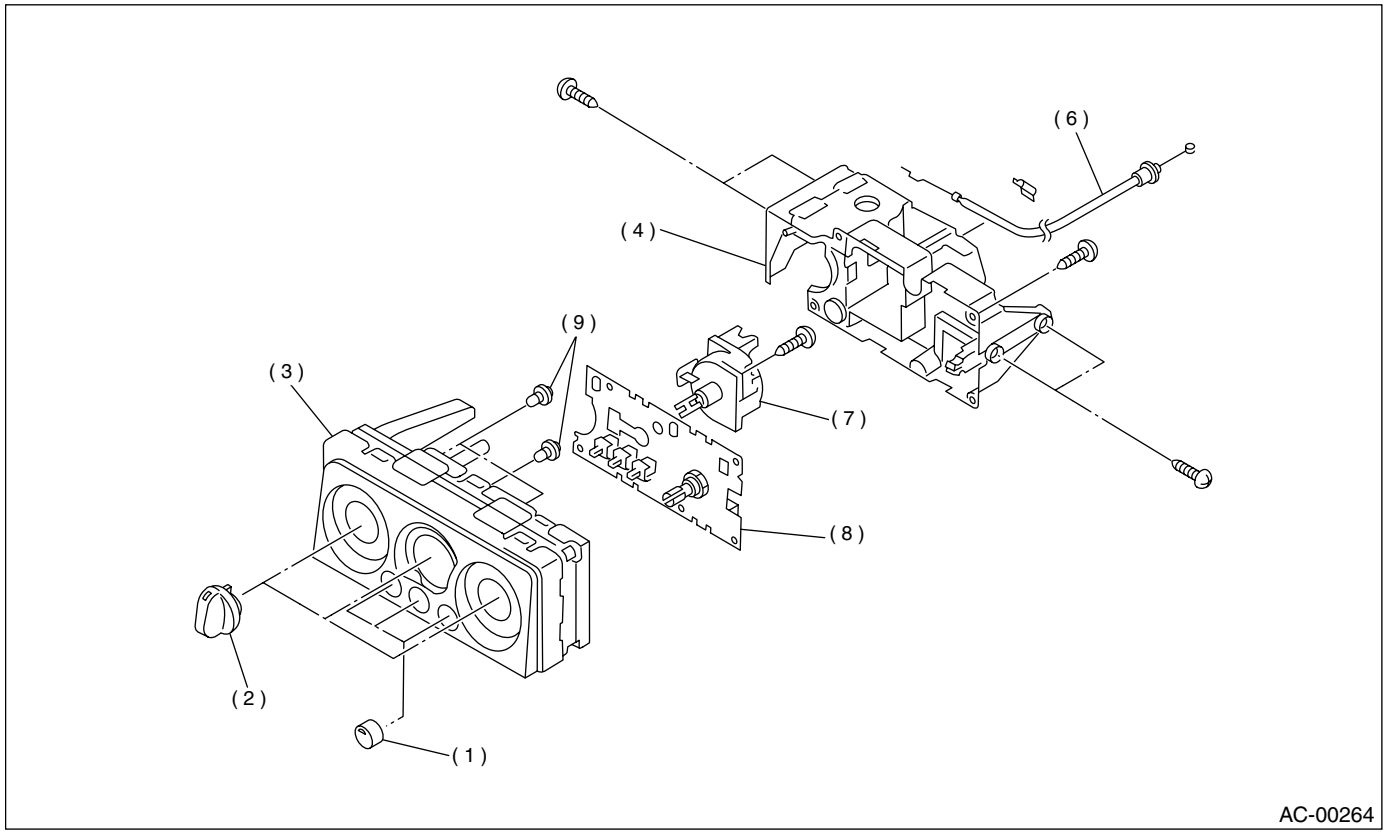
2. INTAKE UNIT WITH EVAPORATOR



(1) Intake door actuator
(2) Lever (A)
(3) Door (A)
(4) Intake unit case upper
(5) Thermistor (With A/C model)
(6) Expansion valve (With A/C model)
(7) Door (B)
(8) Lever (B)
(9) Lever (C)
(10) Blower plate
(11) Resistor
(12) Evaporator (With A/C model)
(13) Evaporator case (With A/C model)
(14) Drain hose
(15) Intake unit case lower
(16) Aspirator pipe
(17) Blower motor
(18) Fan

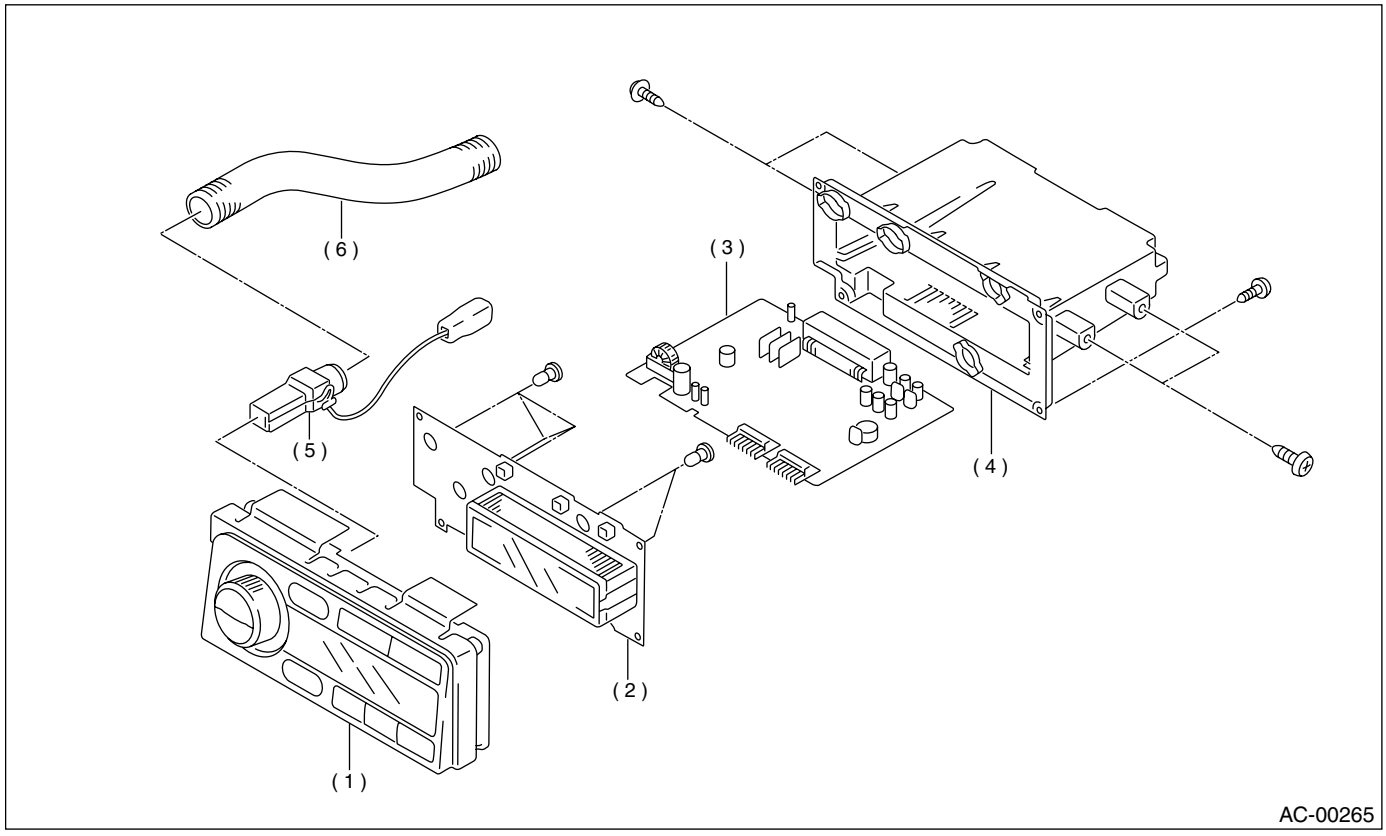
Tightening torque: N·m (kgf-m, ft-lb)
T: 7.4 (0.75, 5.4)

3. CONTROL UNIT (MANUAL A/C)



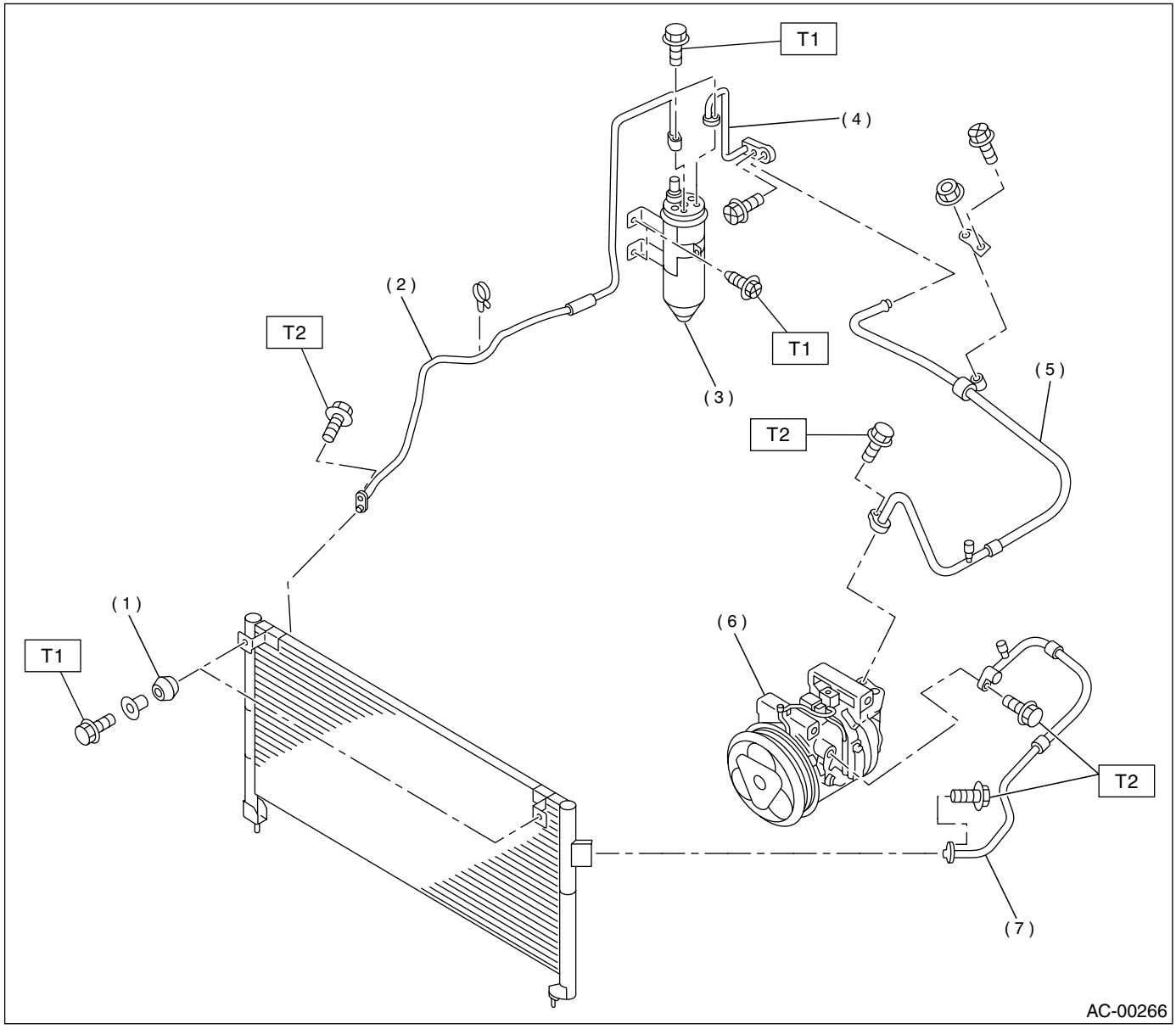
(1) Switch
(2) Dial knob
(3) Panel ASSY
(4) Base unit
(5) Cover
(6) Temperature control cable
(7) Fan switch ASSY
(8) Circuit ASSY
(9) Bulb

4. CONTROL UNIT (AUTO A/C)



(1) Control panel
(2) Circuit ASSY
(3) Control unit
(4) Case
(5) Incar sensor
(6) Aspirator hose

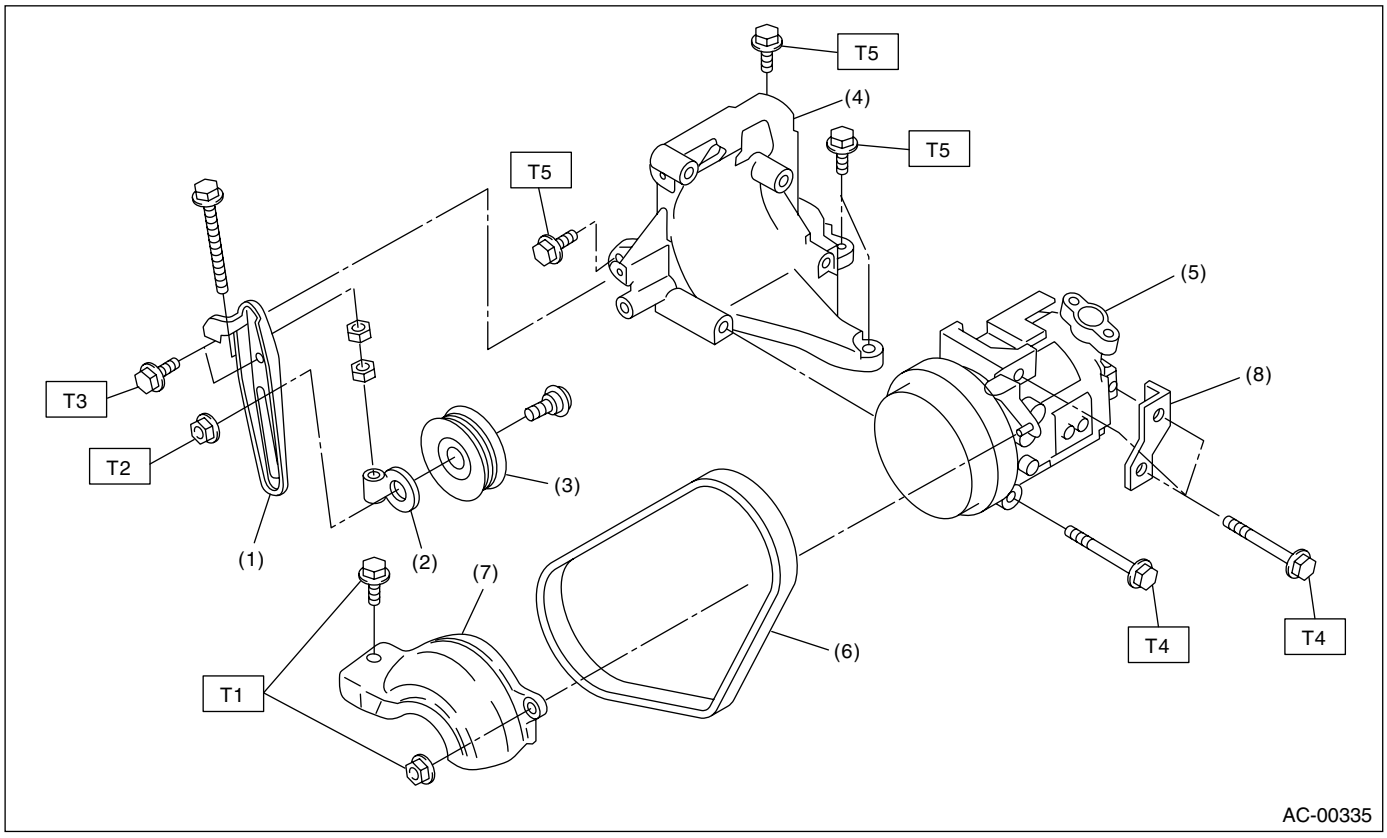
5. AIR CONDITIONING UNIT



(1) Condenser
(2) Pipe (Condenser — Receiver drier)
(3) Receiver drier
(4) Pipe (Receiver drier — Cooling unit)
(5) Hose (Low-pressure)
(6) Compressor
(7) Hose (High-pressure)

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7.4 (0.75, 5.4)
T2: 15 (1.5, 10.8)

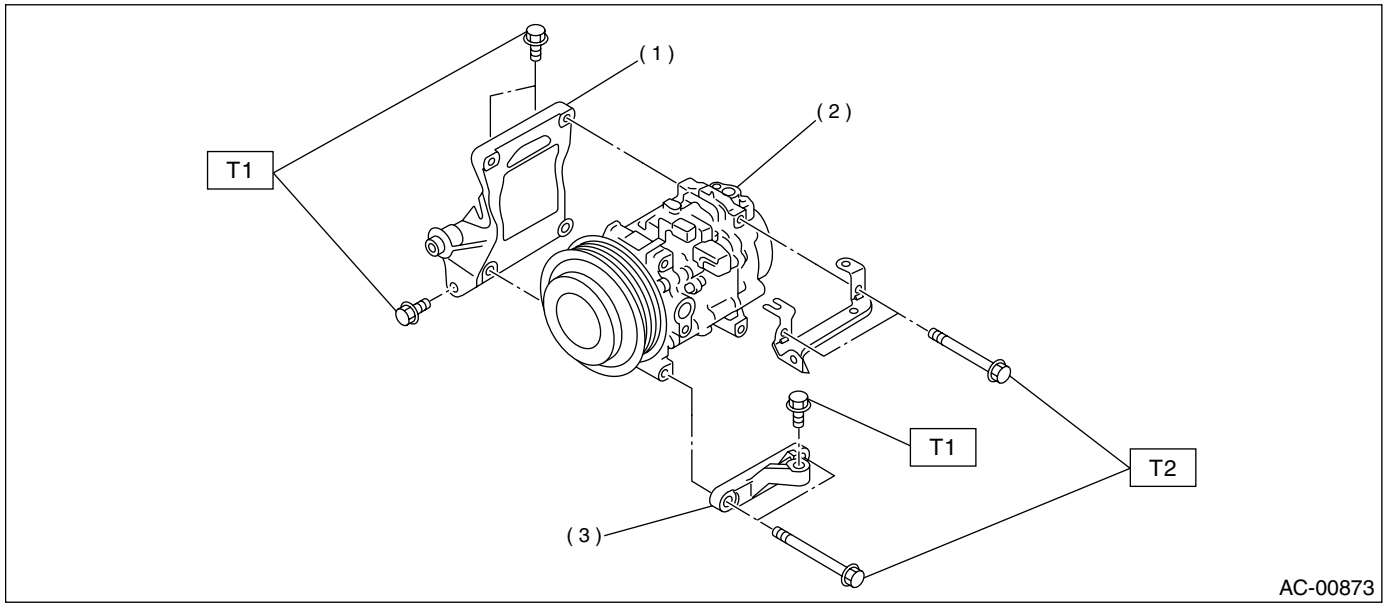
6. COMPRESSOR (4 CYLINDER)



(1) Idler pulley bracket
(2) Idler pulley adjuster
(3) Idler pulley
(4) Compressor bracket
(5) Compressor
(6) V-belt
(7) Compressor belt cover (Non-TURBO model)
(8) Compressor stay

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7.4 (0.75, 5.4)
T2: 22.6 (2.3, 16.6)
T3: 23.0 (2.35, 17.0)
T4: 28.9 (2.95, 21.3)
T5: 35 (3.6, 26)

7. COMPRESSOR (6 CYLINDER)



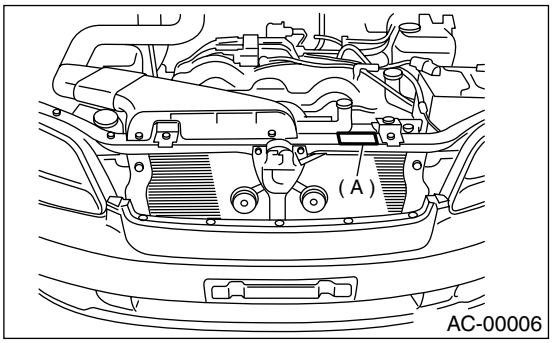
(1) Compressor bracket main
(2) Compressor
(3) Compressor bracket sub

Tightening torque: N·m (kgf-m, ft-lb)
T1: 33 (3.4, 24)
T2: 28.9 (2.95, 21.3)

C: CAUTION

1. HFC-134A A/C SYSTEM

• Unlike the old conventional HFC-12 system components, the cooling system components for the HFC-134a system such as the refrigerant and compressor oil are incompatible.
• Vehicles with the HFC-134a system can be identified by the label “A” attached to the vehicle.
Before maintenance, check which A/C system is installed in the vehicle.



2. COMPRESSOR OIL

• HFC-134a compressor oil has no compatibility with that for R12 system.
• Use only the manufacturer-authorized compressor oil for the HFC-134a system; only use ZXL200PG.
• Do not mix multiple compressor oils.
If HFC-12 compressor oil is used in a HFC-134a A/C system, the compressor may become stuck due to poor lubrication, or the refrigerant may leak due to swelling of rubber parts.
On the other hand, if HFC-134a compressor oil is used in a HFC-12 A/C system, the durability of the A/C system will be lowered.
• HFC-134a compressor oil is very hygroscopic. When replacing or installing/removing A/C parts, immediately isolate the oil from the atmosphere using a plug or tape. In order to avoid moisture, store the oil in a container with its cap tightly closed.

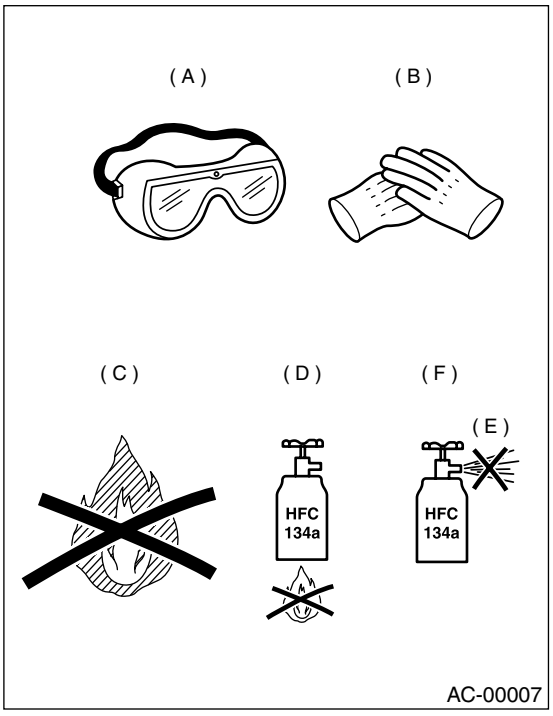
3. REFRIGERANT

• The HFC-12 refrigerant cannot be used in the HFC-134a A/C system. The HFC-134a refrigerant, also, cannot be used in the HFC-12 A/C system.
• If an incorrect or no refrigerant is used, poor lubrication will result and the compressor itself may be damaged.

4. HANDLING OF REFRIGERANT

• The refrigerant boils at approx. –30°C (–22°F). When handling it, be sure to wear safety goggles and protective gloves. Direct contact of the refrigerant with skin may cause frostbite.
If the refrigerant gets into your eye, avoid rubbing your eyes with your hands. Wash your eye with plenty of water, and receive medical treatment from an eye doctor.
• Do not heat a service can. If a service can is directly heated, or put into boiling water, the inside pressure will become extremely high. This may cause the can to explode. If a service can must be warmed up, use hot water in 40°C (104°F) max.
• Do not drop or impact a service can. (Observe the precautions and operation procedure described on the refrigerant can.)
• When the engine is running, do not open the high-pressure valve of the manifold gauge. The high-pressure gas will back-flow resulting in an explosion of the can.
• The refrigerant is non-toxic and harmless under normal operating circumstance, but it may change to phosgene (a noxious fume) under open flames or high temperatures (caused by a cigarette or heater).
• Provide good ventilation and do not work in a closed area.

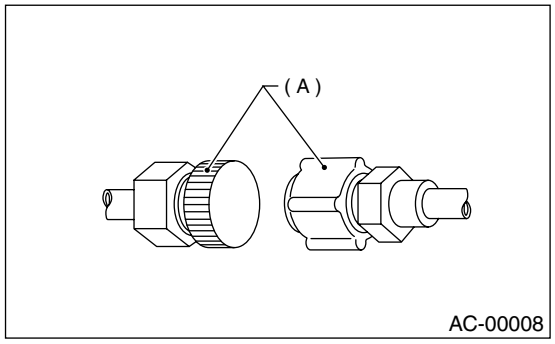
• In order to avoid destroying the ozone layer, prevent HFC-134a from being released into the atmosphere. Using a refrigerant recovery system, discharge and reuse it.



(A) Goggles
(B) Gloves
(C) Avoid open flame
(D) No direct heat on container
(E) Do not discharge
(F) Loosen

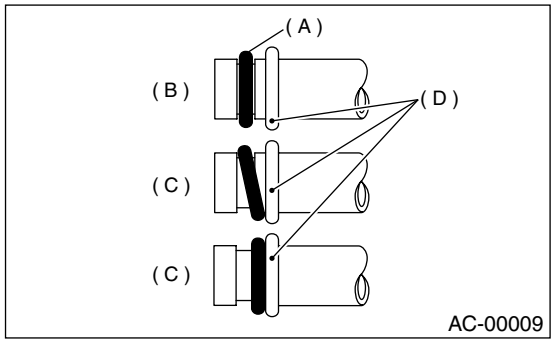
5. O-RING CONNECTIONS

• Use new O-rings.
• In order to keep the O-rings free of lint which will cause a refrigerant gas leak, perform operations without gloves and shop towels.
• Apply the compressor oil to the O-rings to avoid sticking, then install them.
• Use a torque wrench to tighten the O-ring fittings: Over-tightening will damage the O-ring and tube end distortion.
• If the operation is interrupted before completing a pipe connection, recap the tubes, components, and fittings with a plug or tape to prevent contamination from entering.



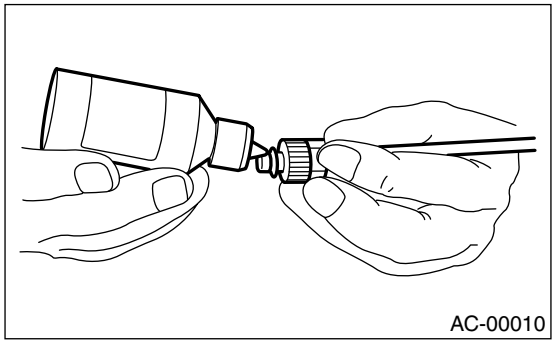
(A) Seal

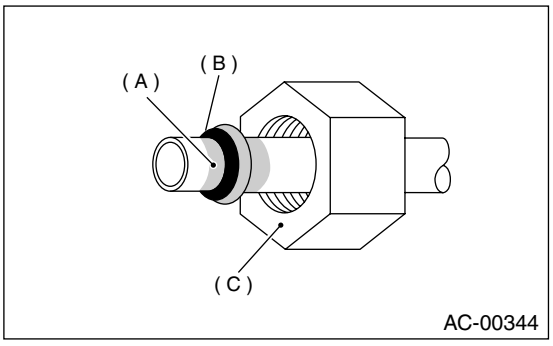
• Visually check the surfaces and mating surfaces of O-rings, threads, and connecting points. If a failure is found, replace the applicable parts.
• Install the O-rings at right angle to the tube bead.



(A) O-ring
(B) OK
(C) NG
(D) Bead

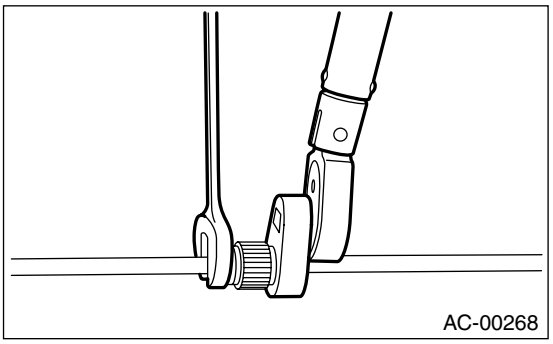
• Use the oil specified in the service manual to lubricate the O-rings.
Apply the oil to the top and sides of the O-rings before installation.
Apply the oil to the O-rings and tube limb.





(A) Apply refrigerant oil
(B) O-ring
(C) Do not apply refrigerant oil to the threads.

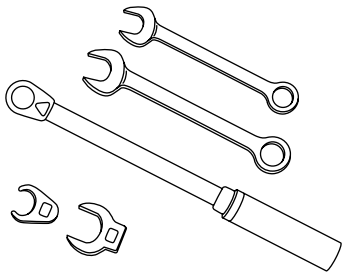
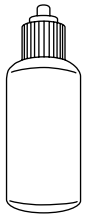
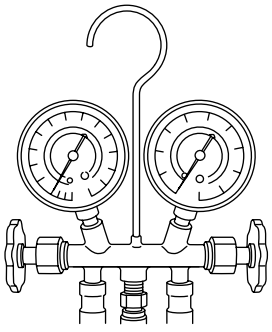
• When connecting hoses or pipes, use 2 wrenches (a torque wrench for tightening). While securing one side with a wrench, tighten the other side to the specified torque with a torque wrench.
If only one wrench is used to tighten, the tightening torque will be excessive or insufficient. This may cause a pipe distortion or gas leak, resulting in damage to hoses and pipes.
• After tightening, using a clean shop towel to remove excess oil from the connections and any oil which may have run on the vehicle body or other parts.
• If any leakage is suspected after tightening, do not retighten the connections, Disconnect the connections, remove the O-rings, and check the O-rings, threads, and connections.

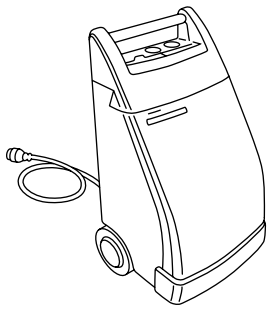
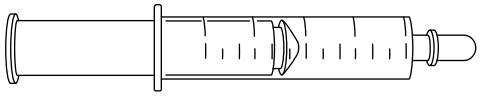
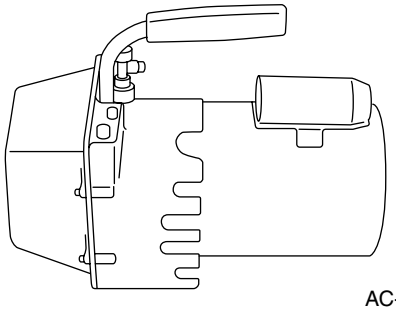
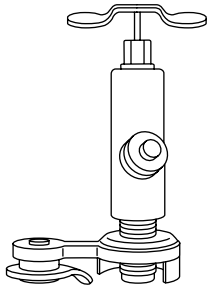
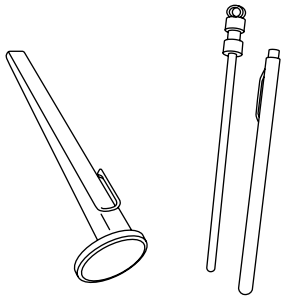


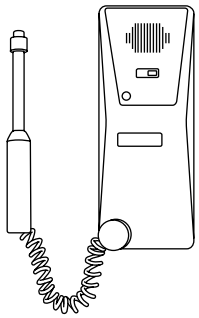
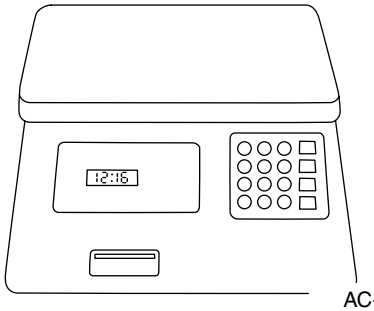
D: PREPARATION TOOL

CAUTION:
When working on vehicles with the HFC-134a system, only use HFC-134a specified tools and parts. Do not mix with CFC-12 tools and parts. If HFC-134a and CFC-12 refrigerant or compressor oil is mixed, poor lubrication will result and the compressor itself may be destroyed.
In order to help prevent mixing HFC-134a and CFC-12 parts and liquid, the tool and screw type and the type of service valves used are different. The gas leak detectors for the HFC-134a and CFC-12 systems must also not be interchanged.

	HFC-134a	CFC-12
Tool & screw type	Millimeter size	Inch size
Valve type	Quick joint type	Screw-in type

Tools and Equipment	Description
Wrench Various **WRENCHES** will be required to service any A/C system. A 7 to 40 N·m (0.7 to 4.1 kg-m, 5 to 30 ft-lb) torque wrench with various crowfoot wrenches will be needed. Open end or flare nut wrenches will be needed for back-up on the tube and hose fittings.	 AC-00347
Applicator bottle A small **APPLICATOR BOTTLE** is recommended to apply refrigerant oil to the various parts. They can be obtained at a hardware or drug store.	 AC-00348
Manifold gauge set A **MANIFOLD GAUGE SET** (with hoses) can be obtained from either a commercial refrigeration supply house or from an auto shop equipment supplier.	 AC-00349

Tools and Equipment	Description
Refrigerant recovery system A **REFRIGERANT RECOVERY SYSTEM** is used for the recovery and reuse of A/C system refrigerant after contaminants and moisture have been removed from the refrigerant.	 AC-00350
Syringe A graduated plastic **SYRINGE** will be needed to add oil back into the system. The syringe can be found at a pharmacy or drug store.	 AC-00351
Vacuum pump A **VACUUM PUMP** (in good working condition) is necessary, and may be obtained from either a commercial refrigeration supply house or an automotive equipment supplier.	 AC-00352
Can tap A **CAN TAP** for the 397 g (14 oz) can is available from an auto supply store.	 AC-00353
Thermometer Pocket **THERMOMETERS** are available from either industrial hardware store or commercial refrigeration supply houses.	 AC-00354

Tools and Equipment	Description
Electronic leak detector An **ELECTRONIC LEAK DETECTOR** can be obtained from either a specialty tool supply or an A/C equipment supplier.	 AC-00355
Weight scale A **WEIGHT SCALE** such as an electronic charging scale or a bathroom scale with digital display will be needed if a 13.6 kg (30 lb) refrigerant container is used.	 AC-00356

2. Refrigerant Pressure with Manifold Gauge Set

A: OPERATION

1) Place the vehicle in the shade and draftless condition.
2) Connect the manifold gauge set.
3) Open the front windows and close all doors.
4) Open the hood.
5) Increase engine speed to 1,500 rpm.
6) Turn ON the A/C switch.
7) Turn the temperature control switch to MAX COOL.
8) Put in RECIRC position.
9) Turn the blower control switch to HI.
10) Read the gauge.

Standard:

Low pressure: 127 — 196 kPa (1.3 — 2.0 kg/cm^2, 18 — 28 psi)
High pressure: 1,471 — 1,667 kPa (15 — 17 kg/cm^2, 213 — 242 psi)
Ambient temperature: 30 — 35 °C (86 — 95 °F)

B: INSPECTION

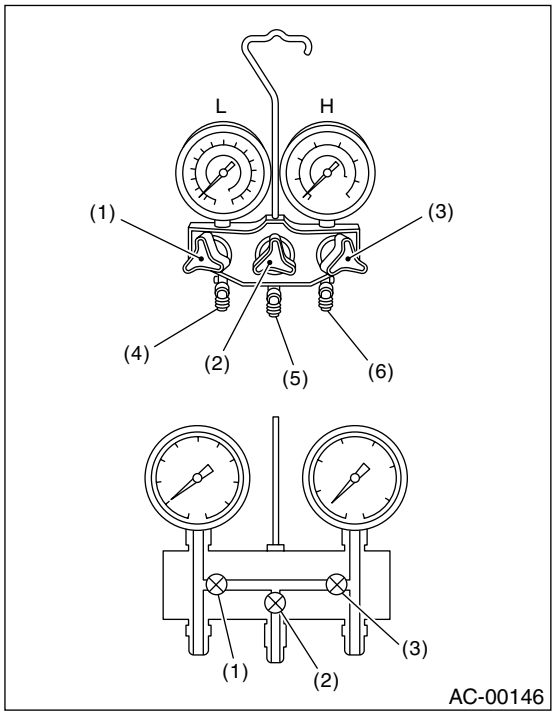
Symptom	Probable cause	Repair order
High-pressure side is unusually high.	• Defective condenser fan motor • Clogged condenser fan • Too much refrigerant • Air inside the system • Defective receiver dryer	• Replace the fan motor. • Clean the condenser fin. • Discharge refrigerant. • Replace the receiver dryer.
High-pressure side is unusually low.	• Defective compressor • Not enough refrigerant • Clogged expansion valve • Expansion valve frozen temporarily by moisture	• Replace the compressor. • Check for leaks. • Replace the expansion valve.
Low-pressure side is unusually high.	• Defective compressor • Defective expansion valve • Too much refrigerant	• Replace the compressor. • Replace the expansion valve. • Discharge refigerant.
Low-pressure side is unusually low.	• Not enough refrigerant • Clogged expansion valve • Expansion valve frozen temporarily by moisture • Saturated receiver dryer	• Check for leaks. • Replace the expansion valve • Replace the receiver dryer.

3. Refrigerant Recovery Procedure

A: OPERATION

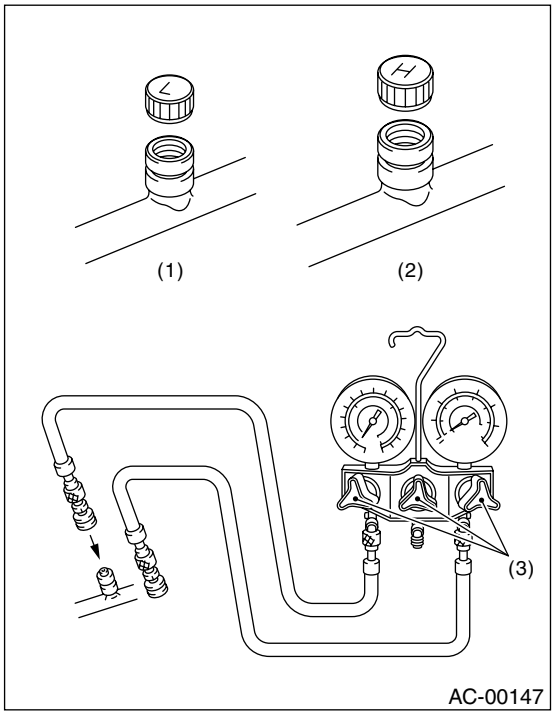
CAUTION:
• During operation, be sure to wear safety goggles and protective gloves.
• Connect the refrigerant recovery system with the manifold gauge set to discharge the refrigerant from the A/C system and reuse it.
• When reusing the discharged refrigerant, keep service cans on hand. Because the discharge rate with the recovery system is approx. 90%, service cans are necessary to charge the refrigerant.
• Follow the detailed operation procedure described in the operation manual attached to the refrigerant recovery system.

1) Perform the compressor oil return operation. <Ref. to AC-26, OPERATION, Compressor Oil.>
2) Stop the engine.
3) Make sure the valves on low-/high-pressure sides of manifold gauge set are fully closed.



L: Low-pressure gauge
H: High-pressure gauge
(1) Low-pressure valve
(2) Vacuum pump valve
(3) High-pressure valve
(4) For low-pressure
(5) For vacuum pump
(6) For high-pressure

4) Install the low-/high-pressure hoses to the service ports on the low-/high-pressure sides of the vehicle respectively.



(1) Low service port
(2) High service port
(3) Close

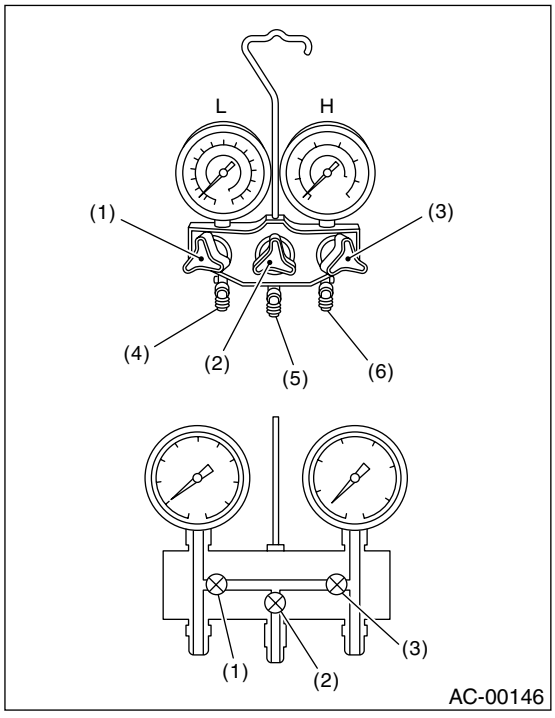
5) Connect the center hose to the refrigerant recovery system.
6) Follow the operation manual to activate the refrigerant recovery system.

4. Refrigerant Charging Procedure

A: OPERATION

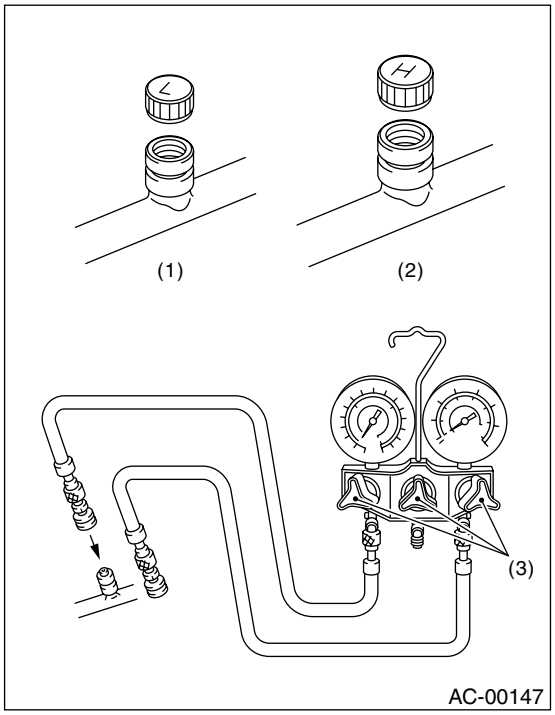
CAUTION:
• During operation, be sure to wear safety goggles and protective gloves.
• If air is mixed in refrigeration cycle, poor cooling may result, and also if moisture is mixed in refrigeration cycle, clogging (freezing) or rust may result.
Before charging the refrigerant, evacuate the system using vacuum pump to remove air and moisture in the system. Moisture can be evaporated and removed easily even at normal temperature, if the system is evacuated using vacuum pump.

1) Close all valves of manifold gauge.



L: Low-pressure gauge
H: High-pressure gauge
(1) Low-pressure valve
(2) Vacuum pump valve
(3) High-pressure valve
(4) For low-pressure
(5) For vacuum pump
(6) For high-pressure

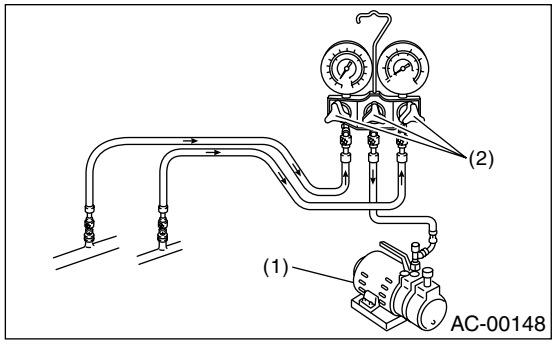
2) Install the low-/high-pressure hoses to corresponding service ports on vehicle.



(1) Low service port
(2) High service port
(3) Close

CAUTION:
Be sure that the hoses are securely connected.

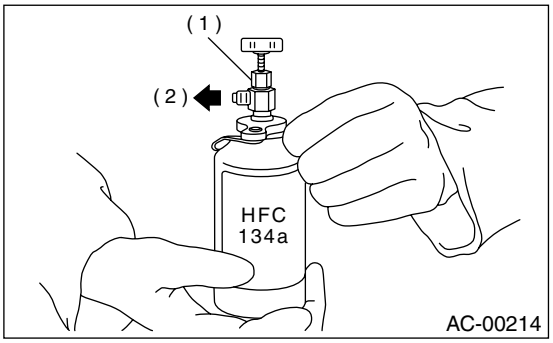
3) Connect the center hose of manifold gauge with vacuum pump.
4) Activate the vacuum pump and then open the valves on low-/high-pressure sides.



(1) Vacuum pump
(2) Open

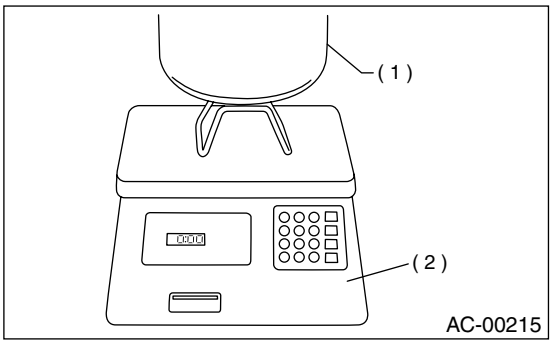
CAUTION:
Be sure to evacuate the system using vacuum pump.

5) After at least 5 minutes of evacuation, if the low-pressure gauge reading shows 100.0 kPa (750 mmHg, 29.5 inHg) or higher, close the valves on center hose to stop the vacuum pump.
6) Leave it at least 5 to 10 minutes after closing the valves on low-/high-pressure sides, and then check the low-pressure gauge reading for any changes. When the gauge reading changes, this is a sign of leakage. Check the pipe or hose connector points, and repair if necessary. Repeat the procedure from 1) after repairing the faulty part.
7) If there are no leaks, further evacuate the system 20 to 30 minutes.
8) Close all valves and stop the vacuum pump.
9) Following the can tap operation manual instructions, install it to refrigerant can.



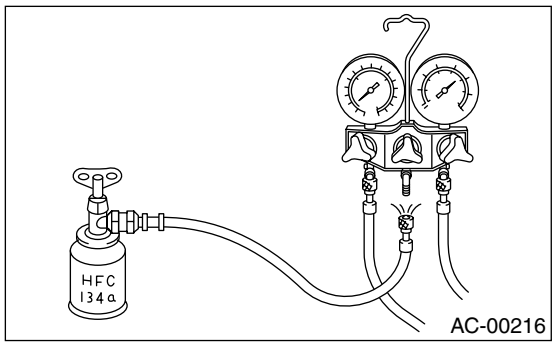
(1) Tap valve
(2) Connect to center hose

10) Disconnect the vacuum pump from center hose, and connect the hose to tap valve.
11) When a refrigerant recovery container is used, measure the refrigerant amount in use using a weighting scale before connecting to center hose.

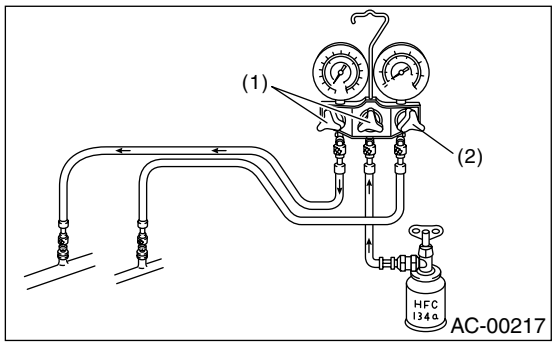


(1) Refrigerant recovery container
(2) Weighting scale

12) Open the valve on HFC-134a source.
13) Loosen the center hose connection on manifold gauge (if applicable, press a purge valve on manifold gauge) only for a couple of seconds to allow the air in the center hose to escape by the refrigerant.



14) Make sure that the high-pressure valve of manifold gauge is closed, and then open the low-pressure side valve only to charge the refrigerant.



(1) Open
(2) Close

CAUTION:
Do not open the high-pressure valve. Be sure to open the low-pressure valve.

15) Close the low-pressure valve when the low-pressure gauge reading reaches 200 kPa (1,500 mmHg, 59.1 inHg).
16) Using a leak tester, check the system for refrigerant leaks.
17) After confirming that there are no leaks with the leak test, charge the required amount of refrigerant.
18) If the HFC-134a source is empty, close the low-pressure valve and then close the valve on can tap before replacing the empty source. Restart charging operation after replacing the HFC-134a source with a new one and purging.
19) Close the low-pressure valve if the charge rate of refrigerant becomes worse.
20) Confirm that both the low-/high-pressure valves are closed. Start the engine with A/C switch OFF.

21) Quickly repeat A/C switch ON-OFF cycles a few times to prevent initial compressor damage.
22) Set up the vehicle to the following status:
- A/C switch ON
- Engine running at 1,500 rpm
- Blower speed setting to “Hi”
- Temperature setting to “MAX COOL”
- Air inlet setting to “RECIRC”
- Window open

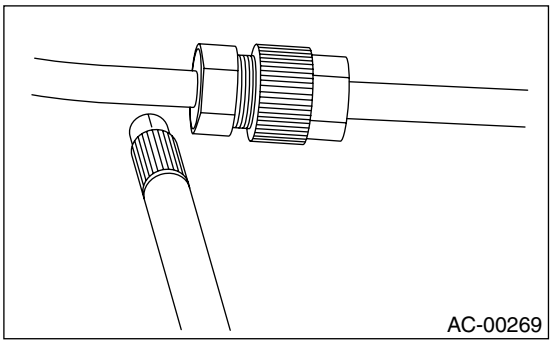
23) Open the low-pressure valve and charge the specified amount of refrigerant.
24) Close all valves and disconnect the hoses from service port after charging the refrigerant.
25) Install the cap to service port.

5. Refrigerant Leak Check

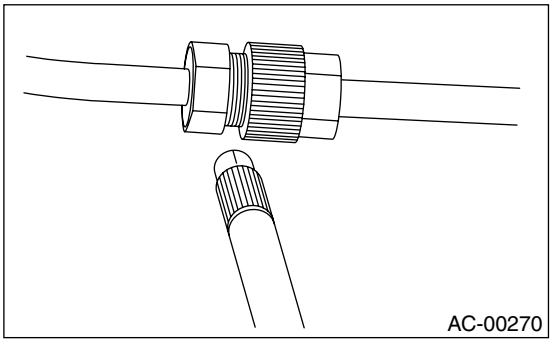
A: INSPECTION

1) Operate the A/C system for approx. 10 minutes, and confirm that the high-side pressure shows at least 690 kPa (7.03 kg/cm^2, 100 psi). Then stop the engine to start the leak test.
2) Starting from the connection between the high-pressure tube and evaporator, check the system for leaks along the high-pressure side through the compressor. The following items must be checked thoroughly.

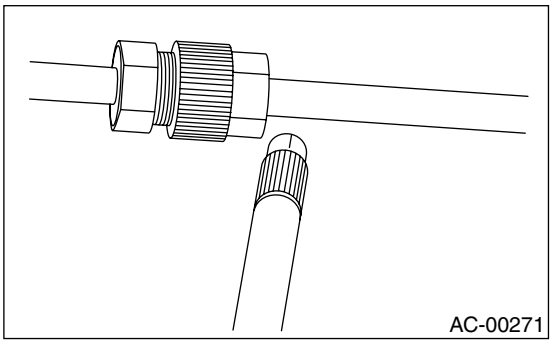
- Connection between the tube and tube fitting



- Connection between 2 parts

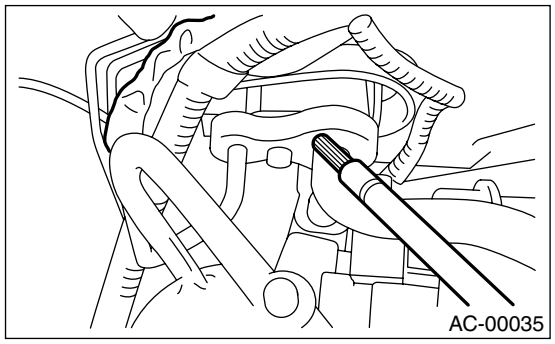


- Connection between the tube and nut



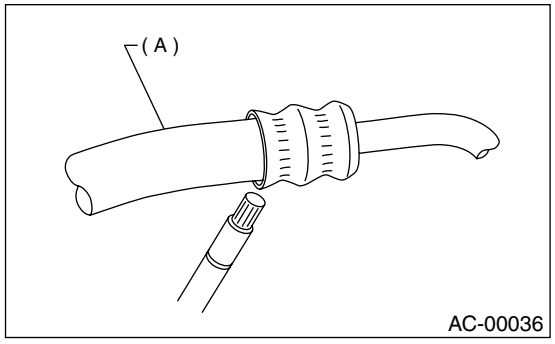
3) Check the joint between the pressure switch (dual switch) and receiver dryer.
4) Check the connections between the condenser and tubes, and welded joints on the condenser.
The leak tester may detect the oil on the condenser fins as a leak.
5) Check the joint between the compressor and hoses.
6) Check the machined area of compressor and other joints on the compressor.
7) Check the thermal limiter (if equipped) on the compressor housing.
8) Check the compressor shaft seal at the area near the center of compressor clutch pulley.
Some shaft seals show a slight amount of leakage about 10 g (0.35 oz) per year. This is not a problem.
9) Starting from the connection between the low-pressure tube and evaporator, check the system for leakage along the high-pressure side through the compressor. The following items must be checked thoroughly.

- Connection between the tube and tube fitting
- Connection between 2 parts
- Connection between the tube and nut



10) Visually check the rubber area of the flexible hose for cracks.
Check the entire length of the flexible hose, especially the connection with the metal hose end.

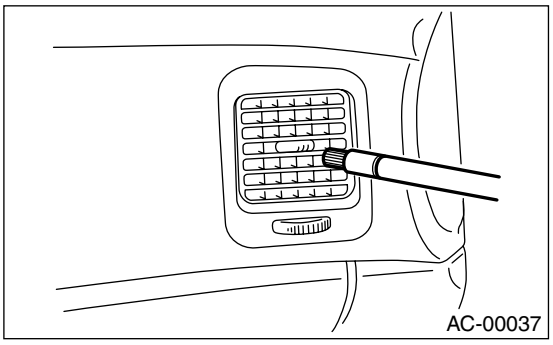
CAUTION:
Carefully check the external surface of hoses and tubes at approx. 25 mm (0.98 in) per second.



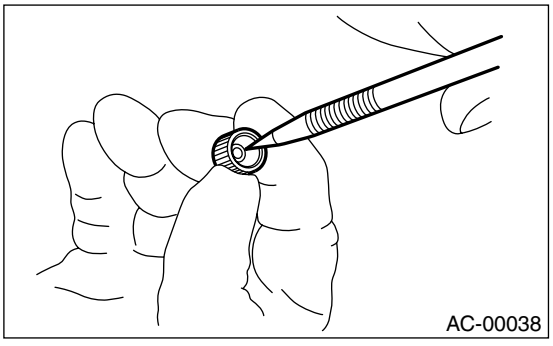
(A) Flexible hose

11) Disconnect the drain hose from the evaporator case, and check the hose end for at least 10 seconds.
After the test is finished, reconnect the drain hose.

12) Turn the ignition key to ON position, and run the blower at high speed for 1 minute. Stop the blower to check the ventilation grille on the instrument panel. While moving the tester closer to the grille, run the blower for 1 or 2 seconds, then stop it. Check the grille at that point for at least 10 seconds.



13) Check the valve in the service port.
14) Visually check the rubber seal in the service port cap.



6. Compressor Oil

A: OPERATION

NOTE:
Before making repairs, conduct the oil return operation to return the compressor oil in circulation with the refrigerant to the compressor.

1) Increase engine speed to 1,500 rpm.
2) Turn ON the A/C switch.
3) Turn the temperature control switch to MAX COOL.
4) Put in RECIRC position.
5) Turn the blower control switch to HI.
6) Leave in this condition for 10 minutes.

B: REPLACEMENT

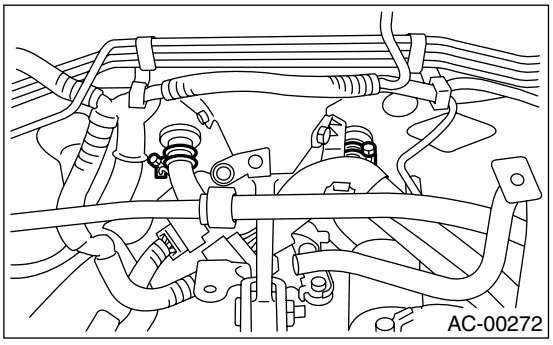
NOTE:
• If a component is replaced, add an appropriate amount of compressor oil.
• When replacing the compressor, the new compressor will already have the specified amount of oil in it. Install the new compressor after removing the same amount of oil that is remaining in the compressor removed.

Replacement parts	Amount of oil replenishment
Evaporator	114 m ℓ (3.9 US fl oz, 4.0 Imp fl oz)
Receiver drier	5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz)
Condenser	2 m ℓ (0.07 US fl oz, 0.07 Imp fl oz)
Hose	1 m ℓ (0.03 US fl oz, 0.04 Imp fl oz)

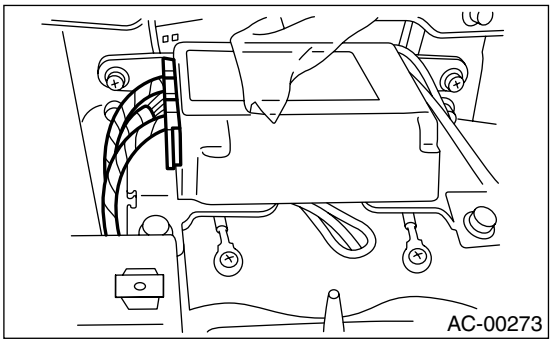
7. Heater Unit

A: REMOVAL

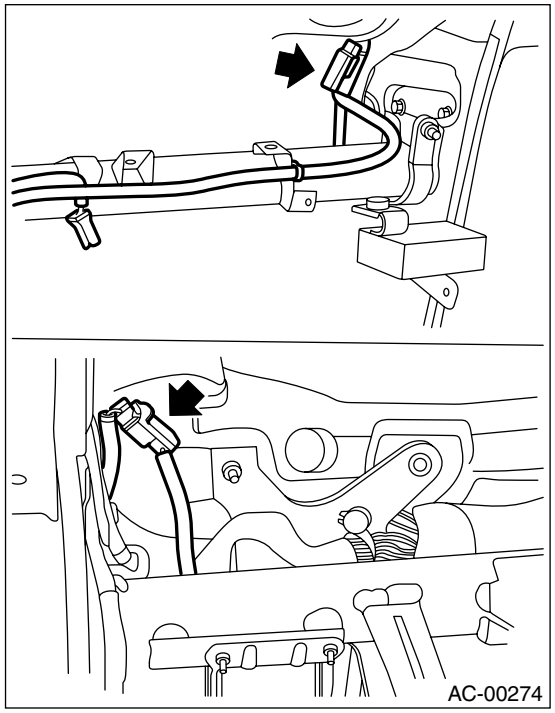
1) Disconnect ground cable from battery.
2) Pull out LLC.
3) Remove air cleaner case.
4) Release heater hose clamps in engine compartment to remove the hoses.


AC-00272

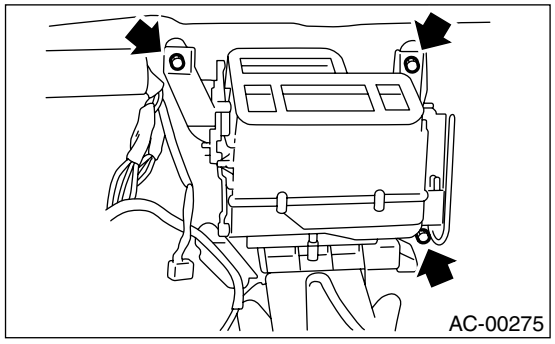
5) Remove A/C unit. <Ref. to AC-36, Intake Unit.>
6) Using a Torx® wrench, remove airbag control unit.


AC-00273

7) Disconnect connector of airbag main harness near steering support beam.


AC-00274

8) Loosen bolts and nuts of support beam to remove support beam.
9) Disconnect servo connector.
10) Loosen bolts and nuts of heater unit to remove heater unit.


AC-00275

B: INSTALLATION

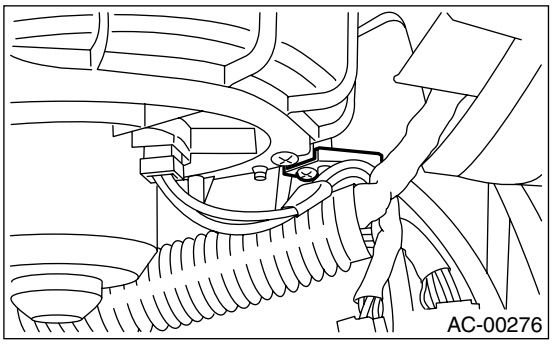
Install in the reverse order of removal.

Tightening torque:
Refer to COMPONENT of General Description
<Ref. to AC-6, HEATER UNIT, COMPONENT, General Description.>

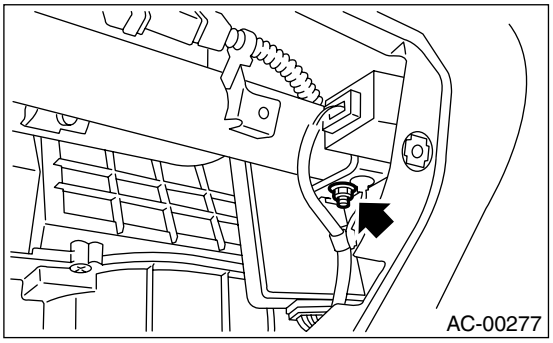
8. Blower Motor Assembly

A: REMOVAL

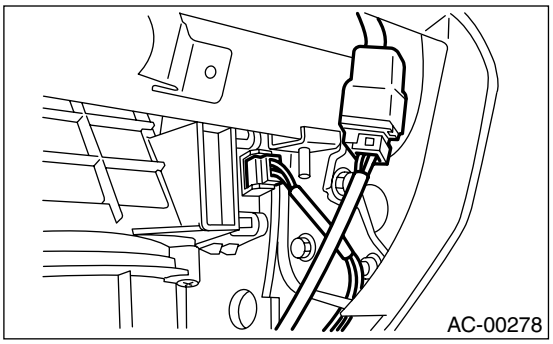
1) Disconnect ground cable from battery.
2) Remove glove box. <Ref. to EI-42, REMOVAL, Glove Box.>
3) Remove mounting bolts of harness stay.



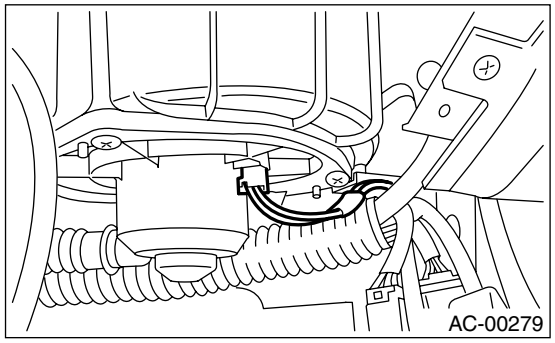
4) Remove nuts of keyless unit stay and cruise unit stay.



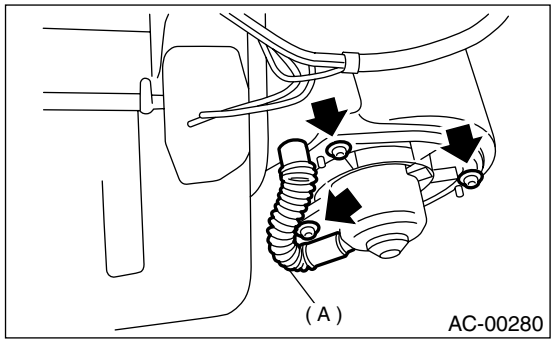
5) Disconnect connector of sunroof.
6) Disconnect servo connector.



7) Disconnect motor connector.



8) Remove 3 screws.
9) Disconnect aspirator pipe (A) and remove blower motor.

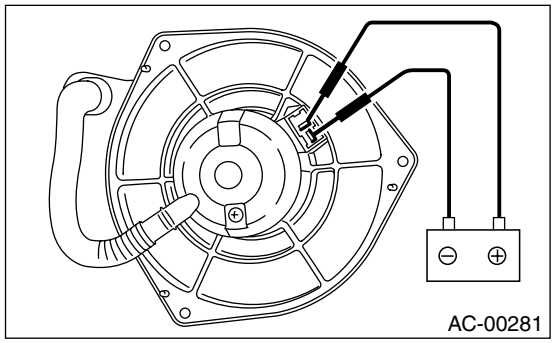


B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

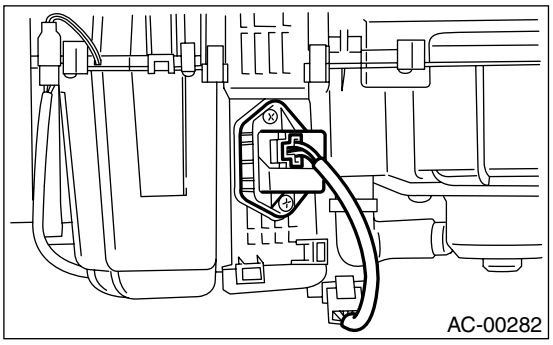
Connect motor connector terminal 1 from the battery to the positive (+) lead and terminal 2 to the negative (–) lead. Make sure the motor runs smoothly.



9. Heater Blower Resistor

A: REMOVAL

1) Remove glove box. <Ref. to EI-42, REMOVAL, Glove Box.>
2) Disconnect power transistor connector.
3) Loosen 2 screws to remove power transistor.

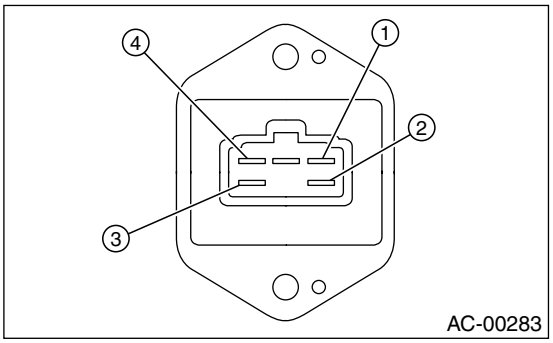


B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

1. MANUAL A/C



Measure switch resistance.

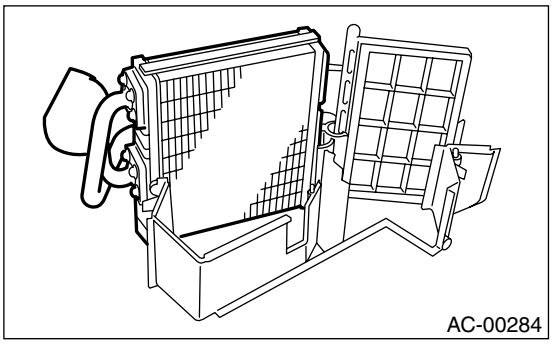
Terminal No.	Condition	Standard
4 and 3	Constant	Approx. 0.46 Ω
3 and 2	Constant	Approx. 0.85 Ω
2 and 1	Constant	Approx. 1.77 Ω

If NG, replace the blower resistor.

10.Heater Core

A: REMOVAL

1) Remove heater unit. <Ref. to AC-27, REMOVAL, Heater Unit.>
2) Remove screws to separate heater unit case.
3) Remove heater core.



B: INSTALLATION

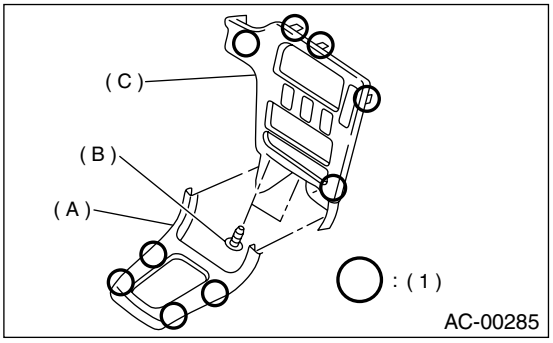
Install in the reverse order of removal.

11.Control Unit

A: REMOVAL

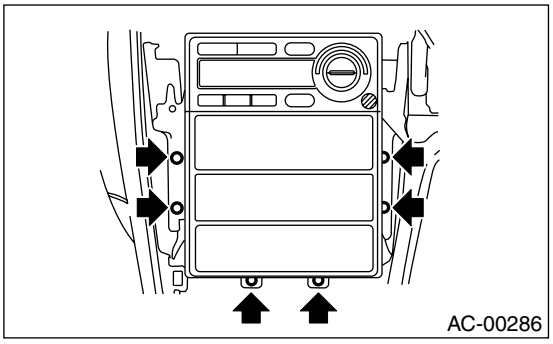
1. AUTO A/C

1) Disconnect ground cable from battery.
2) Remove front cover (A).
3) Loosen 2 screws (B) to remove center panel (C).



(1) Hook pawl

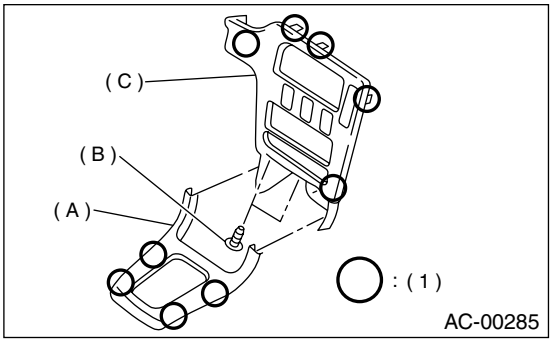
4) Loosen screws to pull control unit slightly out of center console.



5) Disconnect connector from antenna cable to remove control unit.

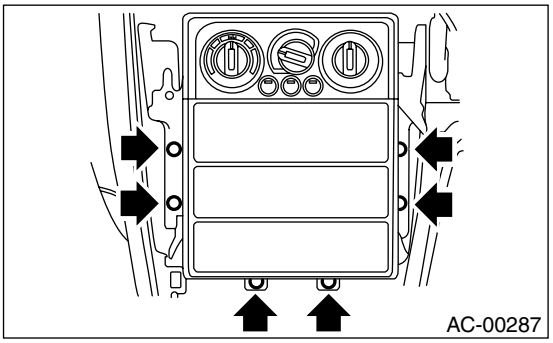
2. MANUAL A/C

1) Disconnect ground cable from battery.
2) Remove front cover (A).
3) Loosen 2 screws (B) to remove center panel (C).



(1) Hook pawl

4) Set temperature control switch to “FULL HOT”, and disconnect temperature control cable from heater unit.
5) Loosen screws to pull control unit slightly out of center console.



6) Disconnect connector from antenna cable to remove control unit.

B: INSTALLATION

1. AUTO A/C

Install in the reverse order of removal.

2. MANUAL A/C

1) Install in the reverse order of removal.
2) Before installation, set temperature control switch to “FULL HOT”.

12.Compressor

A: INSPECTION

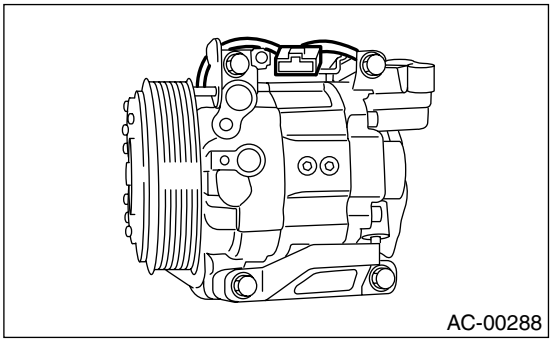
1. MAGNETIC CLUTCH CLEARANCE

1) Check the clearance of the entire circumference around the drive plate and pulley.

Standard:
0.45±0.15 mm (0.0177±0.0059 in)

2. MAGNETIC CLUTCH OPERATION

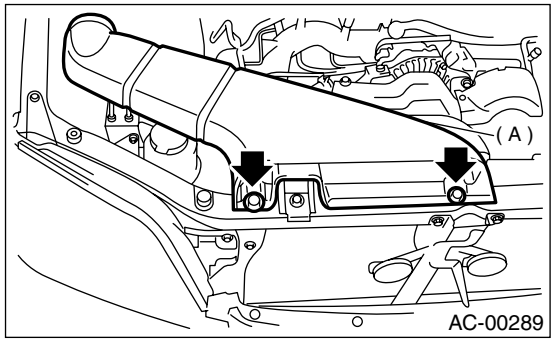
1) Disconnect the compressor connector.
2) Connect the No. 3 terminal of the compressor connector from the battery to the positive (+) lead. Ground the negative (–) lead to the body.


AC-00288

3) Make sure the magnet clutch engages.
If NG, replace the compressor.

B: REMOVAL

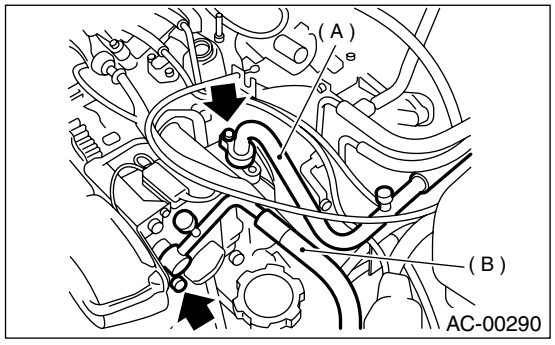
1) Perform oil return operation. <Ref. to AC-26, OPERATION, Compressor Oil.>
2) Turn A/C switch OFF and stop the engine.
3) Using refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, OPERATION, Refrigerant Recovery Procedure.>
4) Disconnect ground cable from battery.
5) Remove duct (A).



AC-00289

6) Disconnect low-pressure hose (A) and high-pressure hose (B).

CAUTION:
Be careful not to lose O-rings on hose. Immediately seal hose with a plug or vinyl tape to prevent the entry of contamination.

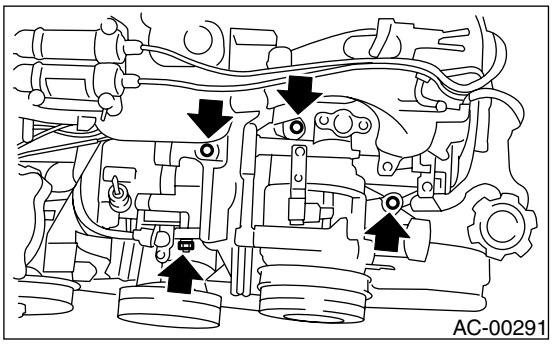


AC-00290

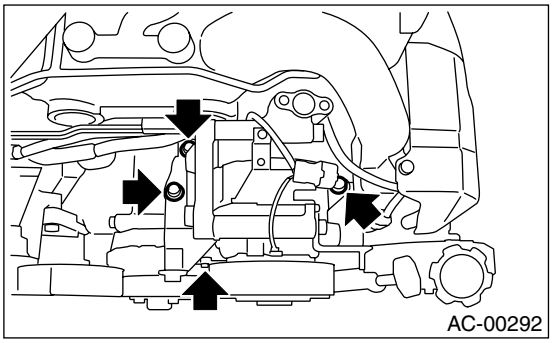
7) Remove V-belt. <Ref. to ME(H6DO)-28, REMOVAL, V-belt.>
8) Remove generator. <Ref. to SC(H6DO)-14, REMOVAL, Generator.>
9) Disconnect compressor harness from body harness.

10) Remove bolts from compressor bracket.

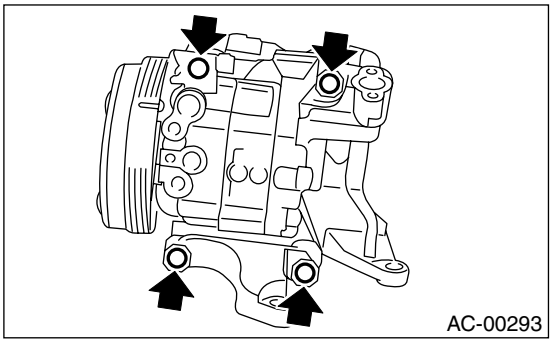
4 CYLINDERS:



6 CYLINDERS:



11) Loosen bolts to remove compressor from bracket.



C: INSTALLATION

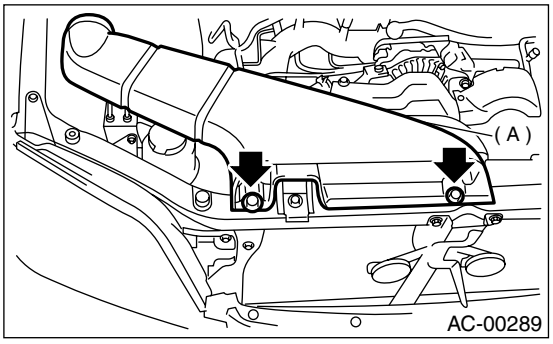
1) Install in the reverse order of removal.
2) Replace O-rings on low-/high-pressure hoses with new ones, then apply compressor oil.
3) When replacing compressor, adjust amount of compressor oil. <Ref. to AC-26, Compressor Oil.>
4) Charge refrigerant. <Ref. to AC-21, OPERATION, Refrigerant Charging Procedure.>

Tightening torque:
Refer to COMPONENT of General Description
<Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.>

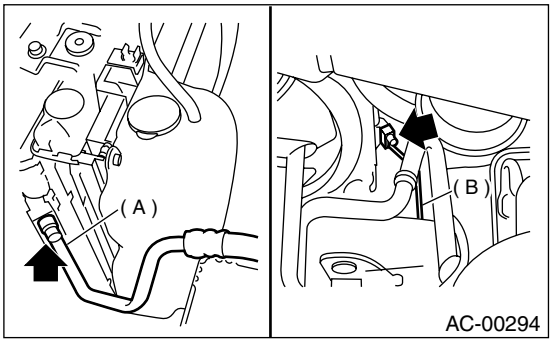
13.Condenser

A: REMOVAL

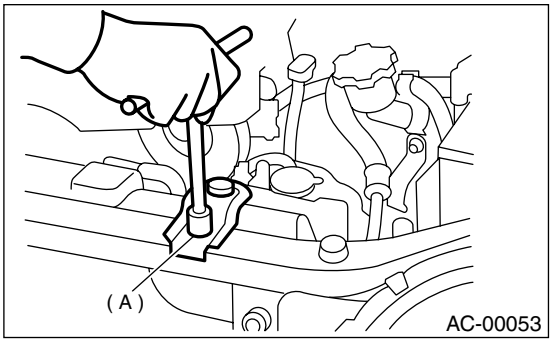
1) Using refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, OPERATION, Refrigerant Recovery Procedure.>
2) Disconnect ground cable from battery.
3) Remove duct (A).



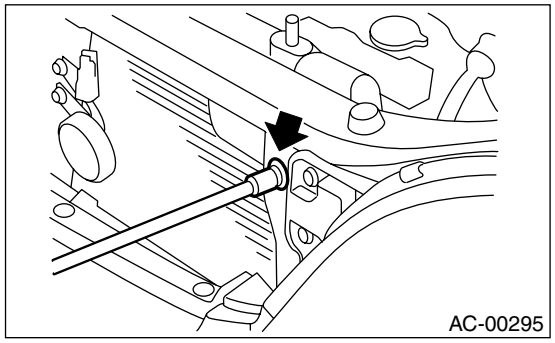
4) Disconnect high-pressure hose (A) and low-pressure hose (B) from condenser.



5) Remove radiator bracket (A).



6) Remove 2 bolts. While lifting condenser, pull it out through the space between the radiator and the radiator panel.

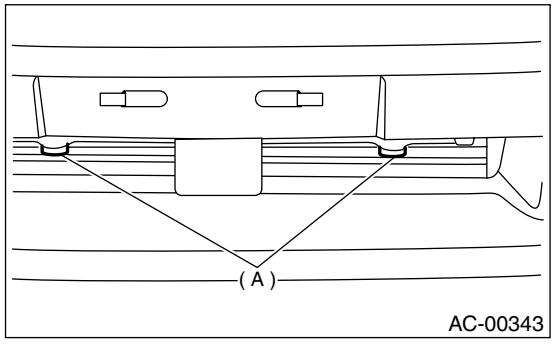


CAUTION:
Be careful not to damage condenser fins. If a damaged fin is found, repair it using a thin screwdriver.
If condenser is replaced, add appropriate amount of compressor oil to the compressor. <Ref. to AC-26, REPLACEMENT, Compressor Oil.>

B: INSTALLATION

1) Install in the reverse order of removal.

CAUTION:
Replace O-rings on hoses or pipes with new ones, and then apply compressor oil. Confirm that lower guide of condenser has been fitted into holes on radiator panel.



2) Charge refrigerant. <Ref. to AC-21, OPERATION, Refrigerant Charging Procedure.>

C: INSPECTION

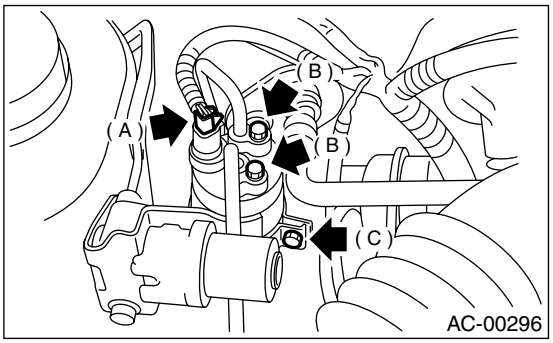
1) Confirm that no dust or insects are found on the condenser fins. Air-blow or flush fins with water as needed.
2) Confirm that no oil leaks from condenser. If a failure is found, replace condenser with a new one.

Tightening torque:
Refer to COMPONENT of General Description
<Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.>

14.Receiver Drier

A: REMOVAL

1) Disconnect ground cable from battery.
2) Using refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, OPERATION, Refrigerant Recovery Procedure.>
3) Disconnect pressure switch harness (A).
4) Disconnect pipe (B).
5) Loosen mounting bolts (C) to remove receiver dryer.



CAUTION:
The receiver drier contains a desiccant. After disconnecting receiver drier, plug it to avoid moisture.
If receiver drier is replaced, add appropriate amount of compressor oil to the compressor. <Ref. to AC-26, REPLACEMENT, Compressor Oil.>

B: INSTALLATION

1) Install in the reverse order of removal.

CAUTION:
Replace O-rings with new ones, and apply compressor oil.

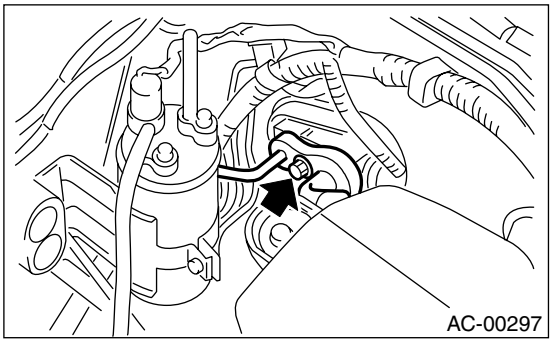
2) Charge refrigerant. <Ref. to AC-21, OPERATION, Refrigerant Charging Procedure.>

Tightening torque:
Refer to COMPONENT of General Description
<Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.>

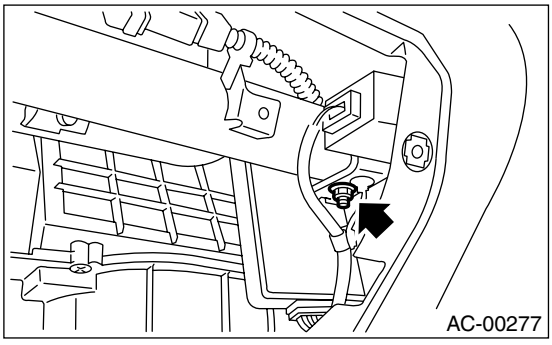
15.Intake Unit

A: REMOVAL

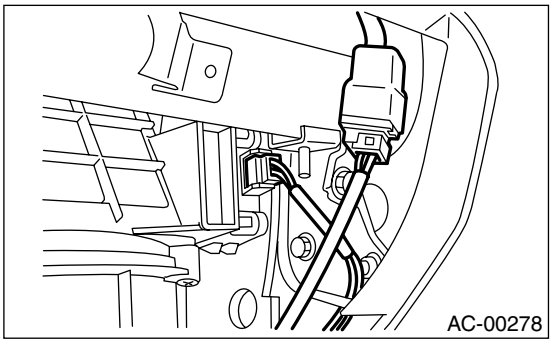
1) Using refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, OPERATION, Refrigerant Recovery Procedure.>
2) Disconnect ground cable from battery.
3) Remove bolts securing expansion valve and pipe in engine compartment.


AC-00297

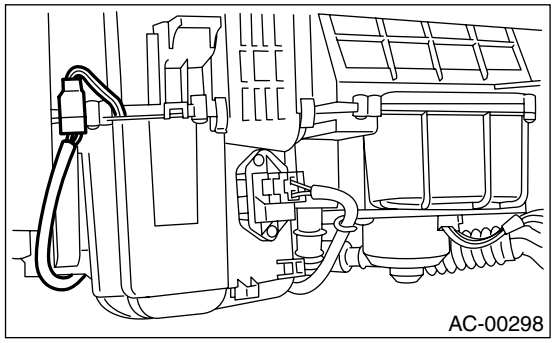
4) Remove instrument panel. <Ref. to EI-46, REMOVAL, Instrument Panel Assembly.>
5) Remove keyless unit and cruise unit.


AC-00277

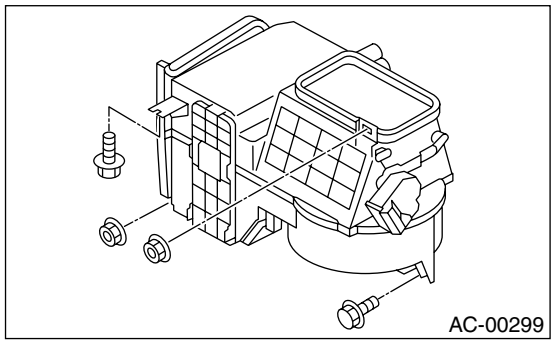
6) Disconnect sunroof connector.
7) Disconnect servo motor connector.


AC-00278

8) Disconnect blower power transistor connector.
9) Disconnect blower motor connector.
10) Disconnect evaporator sensor connector.


AC-00298

11) Remove bolts and nuts on the intake unit.


AC-00299

12) Disconnect drain hose.
13) Remove the intake unit.

B: INSTALLATION

1) Install in the reverse order of removal.

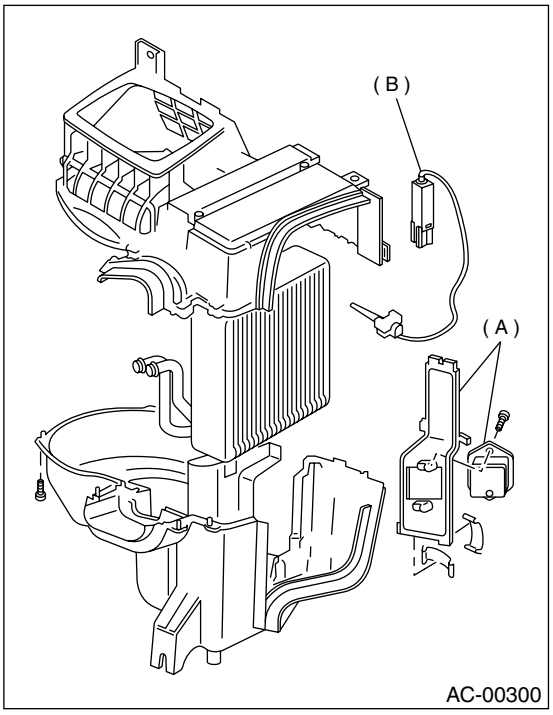
CAUTION:
Replace O-rings with new ones, and apply compressor oil.

Tightening torque:
Refer to COMPONENT of General Description
<Ref. to AC-7, INTAKE UNIT WITH EVAPORATOR, COMPONENT, General Description.>

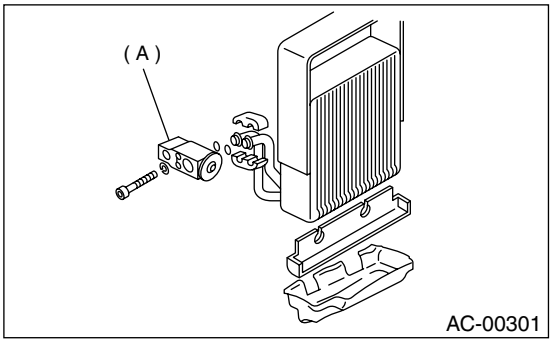
2) Charge refrigerant. <Ref. to AC-21, OPERATION, Refrigerant Charging Procedure.>

C: DISASSEMBLY

1) Remove resistor (A) and thermistor (B) from intake unit case.
2) Remove screws and clips to separate intake unit.



3) Remove expansion valve (A) from evaporator.



CAUTION:
If evaporator is replaced, add appropriate amount of compressor oil to evaporator. <Ref. to AC-26, REPLACEMENT, Compressor Oil.>

D: ASSEMBLY

Assemble in the reverse order of disassembly.

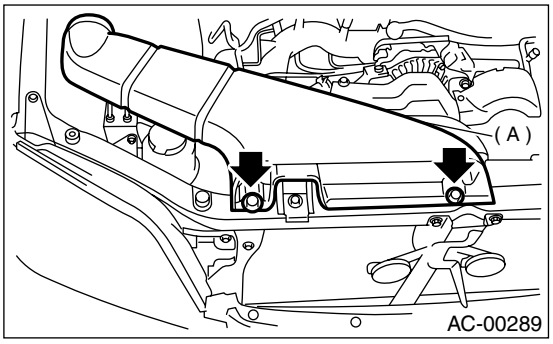
CAUTION:
Replace O-rings with new ones, and then apply compressor oil.

16.Flexible Hose

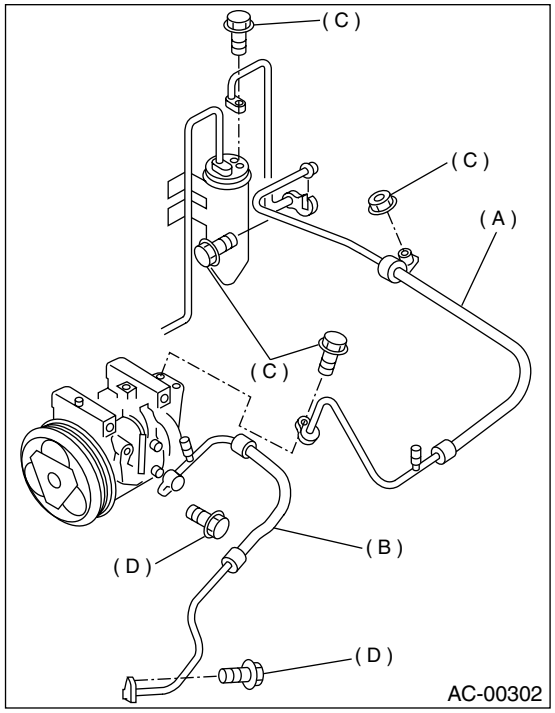
A: REMOVAL

CAUTION:
• When disconnecting/connecting hoses, do not apply excessive force them. Confirm that no torsion and excessive tension exist after installing.
• Seal the disconnected hose with a plug or vinyl tape to prevent contamination from entering.

1) Disconnect ground cable from battery.
2) Using refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, OPERATION, Refrigerant Recovery Procedure.>
3) Remove duct (A).



4) Remove hose attaching bolts (C).
5) Disconnect hose from evaporator unit.
6) Disconnect hose from compressor.
7) Remove low-pressure hose (A) from the vehicle.
8) Remove hose attaching bolts (D).
9) Disconnect hose from compressor.
10) Disconnect hose from condenser.
11) Disconnect high-pressure hose (B) from the vehicle.



B: INSTALLATION

CAUTION:
When disconnecting/connecting hoses, do not apply an excessive force them. Confirm that no torsion and excessive tension exist after installing. Seal the disconnected hose with a plug or vinyl tape to prevent contamination from entering.

1) Install in the reverse order of removal.
2) Charge refrigerant. <Ref. to AC-21, OPERATION, Refrigerant Charging Procedure.>

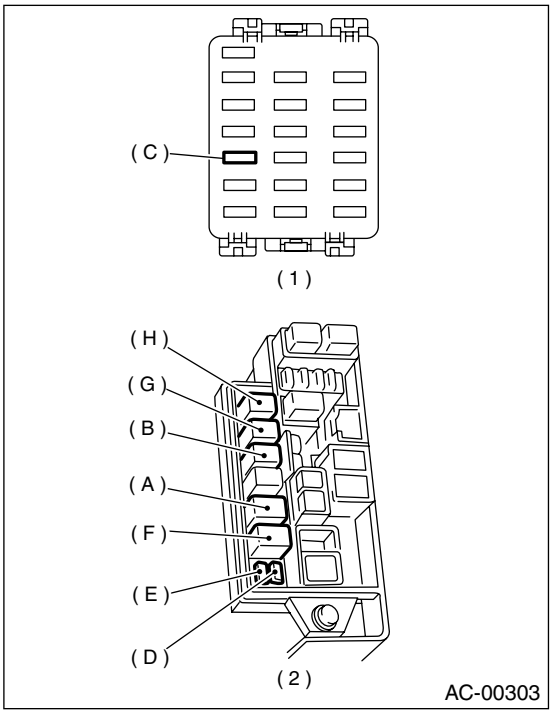
Tightening torque:
Refer to COMPONENT of General Description
<Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.>

C: INSPECTION

NOTE:
If cracking, damage, or swelling is found on a hose, replace it with a new one.

17.Relay and Fuse

A: LOCATION

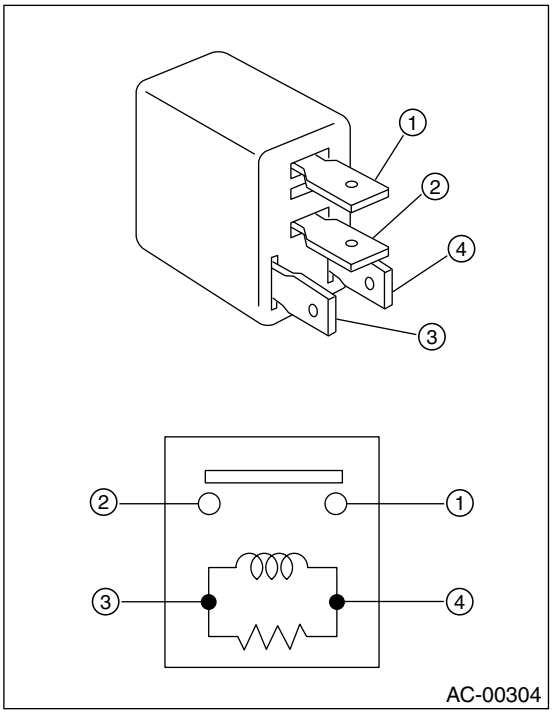


(1) Joint box
(2) Main fuse box

	4 cylinder non-TURBO engine model	4 cylinder TURBO engine model	6 cylinder engine model
Main fan relay	F	F	—
Sub fan relay	B	B	—
Fan mode relay	—	H	—
A/C relay	A	A	A
Main fan relay 1	—	—	F
Sub fan relay 1	—	—	G
Main fan relay 2	—	—	B
Sub fan relay 2	—	—	H
A/C fuse	C	C	C
Main fan fuse	E (20 A)	E (30 A)	E (30 A)
Sub fan fuse	D (20 A)	D (30 A)	D (30 A)

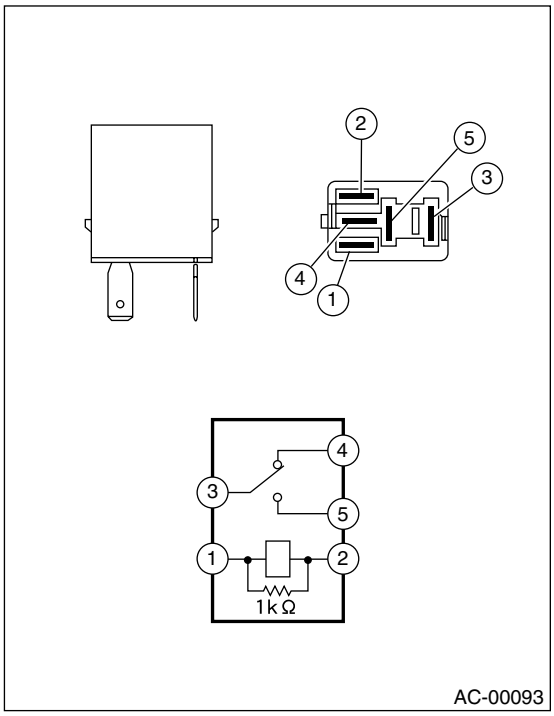
B: INSPECTION

1. 4-TERMINAL TYPE



(3) — (4): Continuity exists.
(1) — (2): No continuity
While applying battery voltage to the terminal between (3) and (4), check continuity between (1) and (2).
If no continuity exists, replace the relay with a new one.

2. 5-TERMINAL TYPE

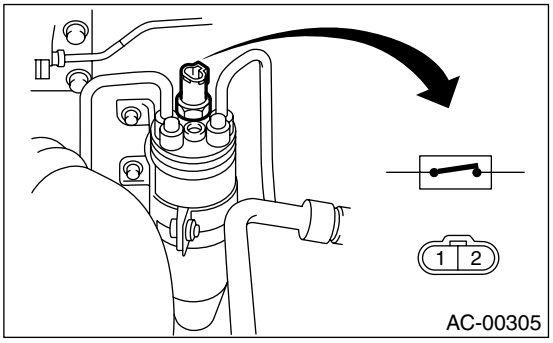


(1) — (2): Continuity exists.
(3) — (4): Continuity exists.
(3) — (5): No continuity
While applying battery voltage to the terminal between (1) and (2), check continuity between (3) and (5).
If no continuity exists, replace the relay with a new one.

18.Pressure Switch (Dual Switch)

A: INSPECTION

1) Connect the manifold gauge to the service valve on the high-pressure side.
2) Remove the pressure switch harness connector. Using a circuit tester, inspect the ON-OFF operation of the pressure switch.

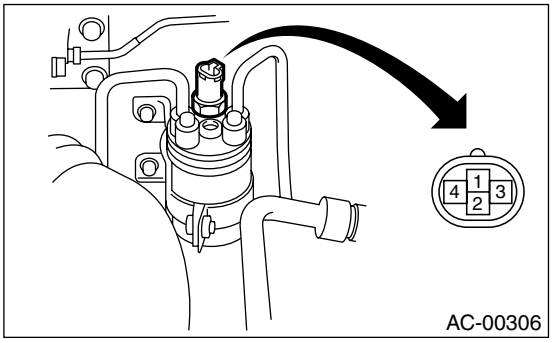


	Tester connection	Operation	Specified condition kPa (kg/cm^2, psi)
High and low pressure switch	1 — 2	Turns OFF.	Increasing to 2,942±196 (30±2, 427±28)
			Decreasing to 177±25 (1.8±0.25, 25.6±3.6)
		Turns ON.	Increasing to 216 (2.2, 31) or less
			Decreasing to 2,354±196 (24±2, 341±28)

19.Pressure Switch (Triple Switch)

A: INSPECTION

1) Connect the manifold gauge to the service manifold on the high-pressure side.
2) Remove the pressure switch harness connector. Using a circuit tester, inspect the ON-OFF operation of the pressure switch.

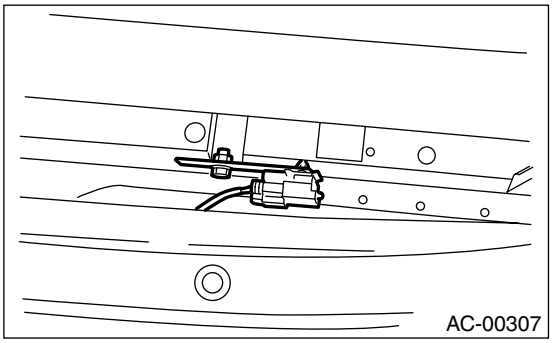


	Tester connection	Operation	Specified condition kPa (kg/cm^2, psi)
High and low pressure switch	1 — 2	Turns OFF.	Increasing to 2,940±196 (29.98±2.00, 426±28)
			Decreasing to 177±20 (1.8±0.2, 26±3)
		Turns ON.	Increasing to 216 or less (2.2, 31)
			Decreasing to 2,350±196 (23.97±2.00, 341±28)
Middle pressure switch	3 — 4	Turns OFF.	1,370±120 (13.97±1.22, 199±17)
		Turns ON.	1,770±100 (18.05±1.02, 257±15)

20.Ambient Sensor (Auto A/C)

A: REMOVAL

1) Open front hood.
2) Disconnect ground cable from battery.
3) Disconnect ambient sensor connector.
4) Remove ambient sensor from radiator lower panel.



B: INSTALLATION

Install in the reverse order of removal.

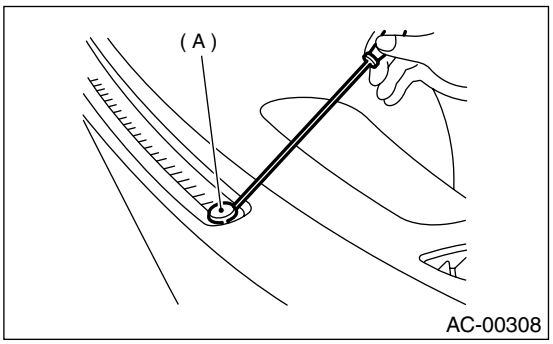
C: INSPECTION

<Ref. to AC-24, DTC 21 OR –21 (AMBIENT SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

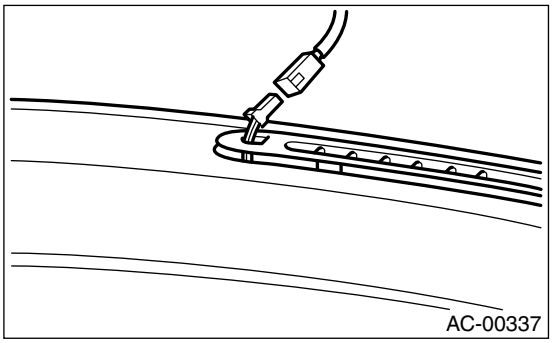
21.Sunload Sensor (Auto A/C)

A: REMOVAL

1) Disconnect ground cable from battery.
2) Insert a screwdriver to remove sunload sensor.



3) Disconnect sunload sensor connector.



CAUTION:
Be careful not to damage sensors and interior trims when removing them.

B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

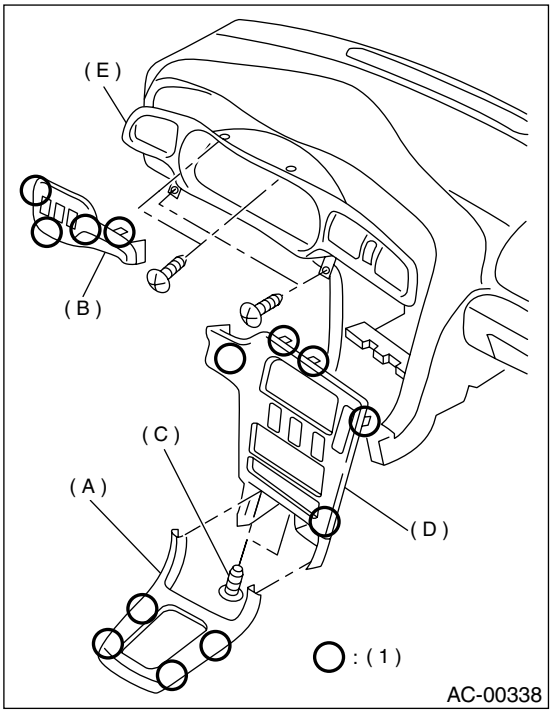
<Ref. to AC-30, DTC 25 OR –25 (SUNLOAD SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

22.Air Vent Grille

A: REMOVAL

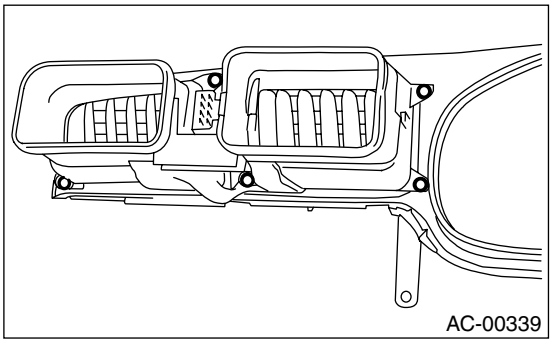
1. AIR VENT GRILLE DRIVER SIDE

1) Disconnect ground cable from battery.
2) Set tilt steering to the lowest position.
3) Disconnect each harness connector to remove front cover (A) and switch panel (B).
4) Loosen screw (C) to remove center panel (D).
5) Remove meter visor (E).



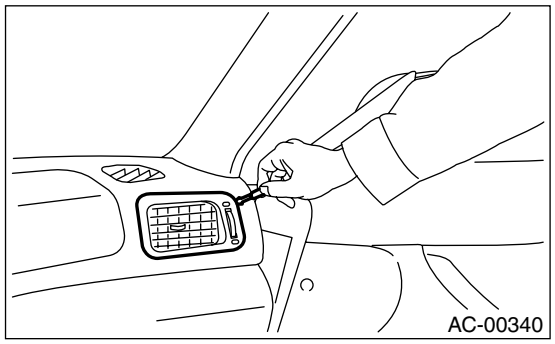
(1) Hook pawl

6) Loosen screws to remove grille.



2. AIR VENT GRILLE PASSENGER SIDE

1) Remove grille using screwdriver.



CAUTION:
Wrap screwdriver with vinyl tape to prevent damage to interior parts.

B: INSTALLATION

Install in the reverse order of removal.

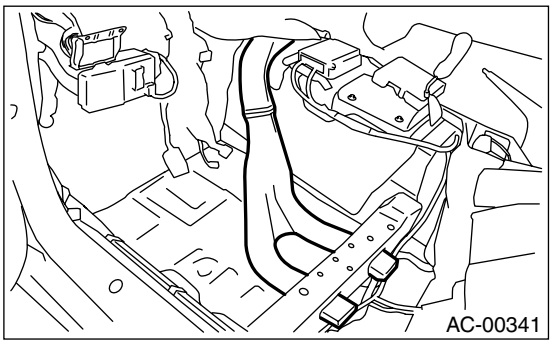
C: INSPECTION

The direction and amount of air should be adjusted smoothly.
The adjustment should be kept in each position.

23.Heater Duct

A: REMOVAL

1) Remove heater unit. <Ref. to AC-27, REMOVAL, Heater Unit.>
2) Remove front seat. <Ref. to SE-8, REMOVAL, Front Seat.>
3) Remove front side sill cover.
4) Pull off floor mat to remove heater duct.



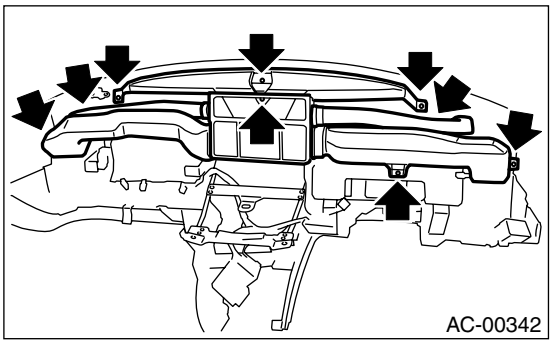
B: INSTALLATION

Install in the reverse order of removal.

24.Heater Vent Duct

A: REMOVAL

1) Remove instrument panel. <Ref. to EI-46, REMOVAL, Instrument Panel Assembly.>
2) Remove 9 screws.
3) Remove heater vent duct.



B: INSTALLATION

Install in the reverse order of removal.

25.General Diagnostics

A: INSPECTION

Symptom		Repair order
Blower motor	Doesn't move.	Fuse
		Blower motor relay
		Blower motor
		Blower motor resistor
		Blower switch
		Wire harness
	Strange noise.	Blower motor
Compressor	Doesn't move.	Refrigerant
		Fuse
		Air conditioning relay
		Magnet clutch
		Compressor
		Pressure switch
		A/C switch
		Blower switch
		Wire harness
	Strange noise	V-Belt
		Magnet clutch
		Compressor
Cold air not emitted.		Refrigerant
		V-Belt
		Magnet clutch
		Compressor
		Pressure switch
		A/C switch
		Blower switch
		Wire harness
		Heater duct
		Heater vent duct
Warm air not emitted.		Engine coolant
		Blower switch
		Heater core
Temperature of air from vents does not change.		Engine coolant
		Mode actuator
		Wire harness
Unable to switch blow vents.		Mode actuator
		Air flow switch
		Wire harness
Unable to switch suction vents.		Air inlet select switch
		FRESH/RECIRC actuator
		Wire harness